THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXVIII. No. 695.] LONDON, SEPTEMBER 5, 1876. [28TH YEAR.] Price 6d.

RAMSAY'S NEWCASTLE CANNEL COAL. Analysis—12,000 cubic feet of gas per ton of coal; 28-candle gas; coke 66·70 per cent.; volatile matters 33·30 per cent. Coke of good quality.

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SPECIAL GASOMETER PAINT
(Mixed ready for use).

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Presented by Her Majesty's Government to the French Government,
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These solidly constructed double-faced Gas-Valves have taken the place of the old system of the light, single-faced disc, which is too uncertain and unreliable in large bores.

They are guaranteed absolutely gas-tight. They are very massive and rigid, and by improved modes of manufacture they are produced at very little excess in cost over the old light, weak system, which is liable to spring and bend, and become leaky.

The Valve is a rigid wedge of solid cast iron, having two perfectly scraped surfaced facings fitting between the two on the body, which are also surfaced.

A spring in two short halves, and, therefore, not liable to break, is used only for scraping the front facing clean.

The front facing is vertical; the back facing forms the wedge.

At a slight additional expense both flanges are faced to bolt to main-pipes.

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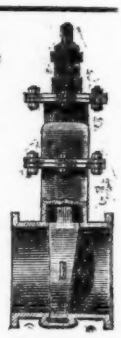

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By use of which Man-lid, inlet and outlet pipes can be examined and cleansed without loss of gas in crown of holder, or ingress of atmospheric air.

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(NOW AT WORK AT WAKEFIELD GAS-WORKS)

Effects a Great Saving in Labour, estimated at about £2 per Mouthpiece per Annum; Renders Gas Companies less Dependent on Skilled Stokers; Makes a Charge Evenly and Quickly, and Prevents Waste of Gas; and can be Supplied and Erected at £2 10s. per Mouthpiece, including Royalty.

FOR FURTHER PARTICULARS, APPLY TO THE SOLE LICENSEE,

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CITY BUILDINGS, CORPORATION STREET, MANCHESTER,

WHERE A WORKING MODEL MAY BE SEEN.

N.B.—*The above Advertisement will appear in the first* JOURNAL OF GAS LIGHTING *in each Month.*

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(Successors to JOHN WILLIAM O'NEILL & CO.,)

Offices—PALMERSTON BUILDINGS, OLD BROAD STREET, LONDON, E.C.,

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The superiority of the material supplied by this Company is generally recognized, and it is now in use in nearly all the London and most of the large Provincial Gas-Works.

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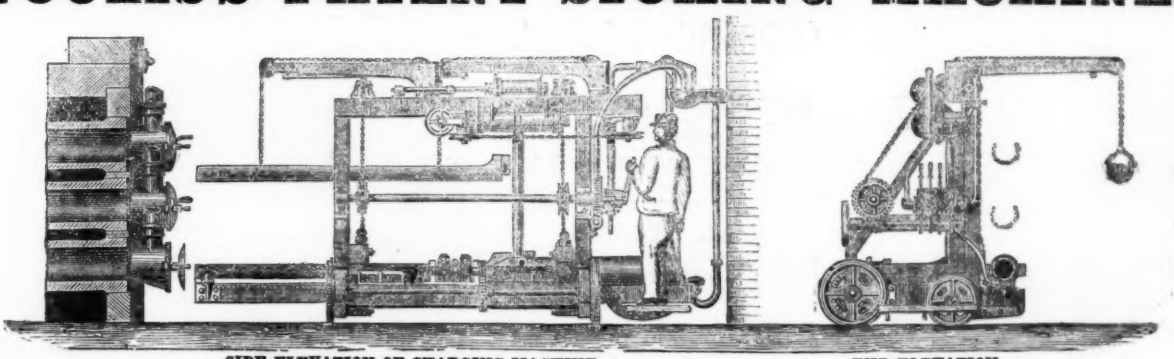

SIDE ELEVATION OF CHARGING MACHINE. END ELEVATION

(*The Drawing Machine will be Illustrated in next week's Advertisement.*)

Makers: TANGYE BROTHERS and HOLMAN, London and Birmingham; ADAM WOODWARD and SON, Manchester; ROBERT LAIDLAW and SON, Glasgow; MASCHINENBAU-ACTIEN-GESELLSCHAFT HUMBOLDT, Kalk bei Deutz; Or all particulars may be had from JAMES WOTHERSPOON, 31, St. Vincent Place, Glasgow.

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MANUFACTURERS OF

"WET" & "DRY" GAS-METERS IN IRON & TIN-PLATE CASES,

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Attention is called to their Dry Meters in Wood Cases, as used by the principal London Gas Companies. These Meters are especially suitable for seaport towns and for export.

The Company repair or convert every description of Wet Gas-Meters to De Castro and Burton's Patent.

HODGE & CO.'S

IMPROVED VENTILATING SUN-LIGHTS

WITH TALC REFLECTORS AND SELF-ACTING VALVES TO PREVENT DOWN-DRAUGHT;

VENTILATING GLOBE LIGHTS for DINING-ROOMS, LIBRARIES, &c.

Ormolu, Bronze, & Crystal Gaseliers;

MEDIÆVAL CHURCH WORK AND CORONÆ

COCKS, VALVES, and FITTINGS for GAS, STEAM, and WATER;

COLUMNS, BRACKETS, & STREET LANTERNS;

BLACK AND GALVANIZED BARREL COMPO AND TIN PIPE.

GAS ENGINEERS,

100, HATTON GARDEN, LONDON.

Drawings and Prices upon application.

JOHN WRIGHT AND CO., ESSEX WORKS, BIRMINGHAM,

Beg to call the attention of MANAGERS and DIRECTORS of GAS COMPANIES to the following letter which they have lately received.

COPY OF LETTER RECEIVED FROM MAGNUS OHREN, Esq.

Crystal Palace District Gas Company, Lower Sydenham, S.E.

To Messrs. John Wright and Co., Essex Works, Birmingham.

Dear Sirs,—In reply to your inquiries, I am glad to state that the use of GAS COOKING AND HEATING STOVES has been a complete success here. We have several hundred in use in our districts. We also find it advantageous to let out Stoves at a small rental. We have now 275 Stoves at rent.

The Stoves you make I can with confidence recommend, having so many in use, and giving satisfaction. I need scarcely point out to you the advantage to Gas Companies to recommend the use of Gas Stoves to their Gas Consumers, even where they do not supply them on sale or rent, as the use of Gas Stoves brings day consumption, and thus the Company make a profit by day as well as by night.—I am, dear sirs, yours faithfully, MAGNUS OHREN.

Size, 25½ in. high; 14 in. wide; 12½ in. back to front.

Price 50s., complete with Pan and Gridiron.

GAS HEATING STOVES

(TERRA COTTA AND IRON).

THE CHEERFUL STOVE.

COOKING STOVES.

BREAKFAST COOKERS.

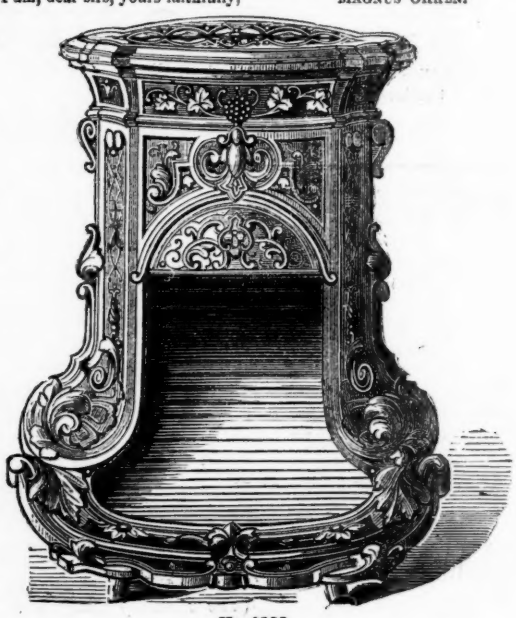
BATHS HEATED by GAS

GAS STOVES

For Boiling, Broiling, Preserving, Heating Flat Irons, and for all other Domestic Purposes.

Gas Companies and the Trade who have not our Illustrated Catalogue are respectfully requested to apply for same.

A LIBERAL DISCOUNT to the TRADE.



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THE CHEERFUL GAS STOVE, with Copper Reflector,

Has all the appearance of a Bright Fire.

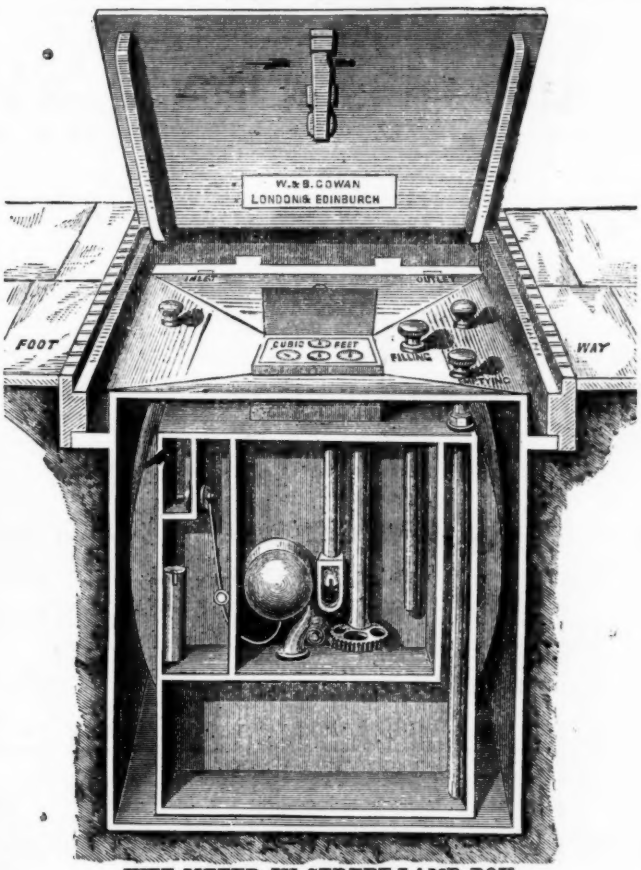
PRICE from 32s.

AVERAGE METER SYSTEM

FOR

STREET-LAMPS.

DRY METER
IN STREET-LAMP PILLAR.



WET METER IN STREET-LAMP BOX UNDER ROADWAY.

The above is offered as the best and simplest arrangement of Street-Lamp Wet Meter, and Box for placing under the roadway.

The Index is read, the water supplied, and the overflow-box pumped, without disturbing any inside lid, but only the footway door.

When necessary to take out the Meter, remove the filling and emptying plugs, and the two thumb-screws which secure the inside lid, which can then be taken off, and the Meter disconnected at inlet and outlet unions.

To prevent water entering the box, the inside lid is made raised, and the edges returned over those of the box, and the thumb-screw and index openings are protected by "collars."

The footway frame can be supported either by brick-work or by "lugs" cast on the box.

The Meter shown is on Esson's Patent Fountain Principle, but it will be understood that the same box arrangement is equally applicable to non-fountain meters; and if these latter are furnished with WARNER AND COWAN'S PATENT SELF-REGULATING DRUMS, the long range of water-line renders a fountain superfluous, while the *registration will be practically unvarying.*

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Communications addressed to J. SUGG & Co., GHENT, will receive immediate attention.

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WILLIAM FRASER,

INVERKEITHING,

Owner of the Works at which Fire-Clay Retorts were first made), can supply

RETORTS, FIRE-BRICKS, &c.,

to any extent.

References can be given to managers of above a hundred Gas-Works whom he supplies.

He ships at Charlestown his

CELEBRATED HALBEATH STEAM COALS,

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FIRE-BRICK AND TILE MERCHANTS,

Wholesale and for Exportation,

FALCON DOCK, 78 AND 79, BANKSIDE,

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DEPÔT for STOURBRIDGE AND NEWCASTLE FIRE-BRICKS, LUMPS, TILES, and FIRE-CLAY, and every Article suitable for

GAS AND WATER WORKS.

LAMP-PILLARS,

GAS-LAMPS, FOUNTAINS.

Our New and Choice Designs for the above, with prices, are forwarded to any part of the world on receipt of twelve stamps. Estimates for work at home or abroad.

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SZERELMEY STONE LIQUID,

Which waterproofs and casehardens every kind of masonry, and

SZERELMEY IRON PAINT,

"The only permanent preservative against rust," having enjoyed the approval and recommendation of the most eminent authorities, including SIR CHARLES BARRY, SIR R. I. MURCHISON, PROFESSOR FARADAY, "THE TIMES," "PALL MALL GAZETTE," "ENGINEER," "BUILDING NEWS," "IRON," and very many others.

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Need only offer to send prices and particulars of the various kinds. Address

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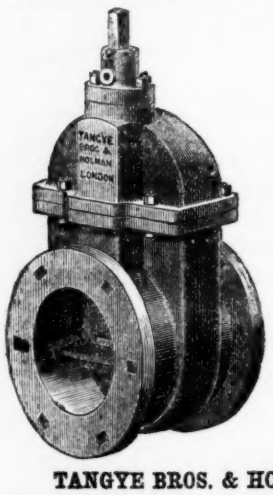
GAS-VALVES.



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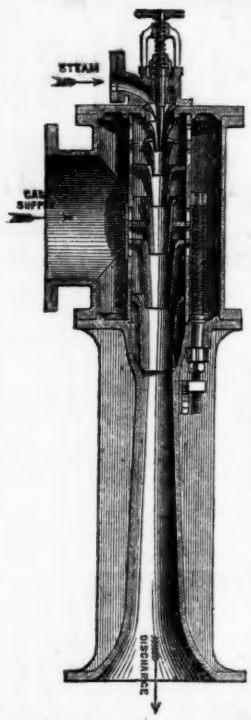

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STEAM-JET GAS-EXHAUSTER.

IMPROVED CLELAND'S PATENT.

Small Cost—Compactness—Perfectly Self-Acting—Self-Regulating—Self-Cleansing—No Steam-Engine—No Attention—No Extra Room Required—No Wear and Tear—No Noise—No Oscillation in Vacuum, or Back Pressure.

UPWARDS OF 200 IN USE.

SUPPLIED TO—

Chartered Gas Co.	Glasgow Corporation.	Hanna, Donald, and Wilson, London.
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Ipswich Gas Co.	Guildford Gas-Works.	Waterside Gas-Works, Todmorden.
Cheltenham Gas Co.	Gloucester Gas-Works.	F. W. Grafton and Co., Accrington.
Sandwich Gas Co.	Kirkintilloch Gas-Wks.	
Cornholme Dis. Gas-Wks.	Nantwich Gas-Works.	
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&c., &c., &c.

E. KÖRTING'S PATENT STEAM-JET REVIVIFYING BLOWERS FOR THE PURIFYING MATERIAL.

SOLE LICENSEES FOR

W. CLELAND'S PATENT STEAM SCRUBBER,

Combining small cost and thorough efficiency, with absence of any mechanical means and necessity of renewing the scrubbing material.

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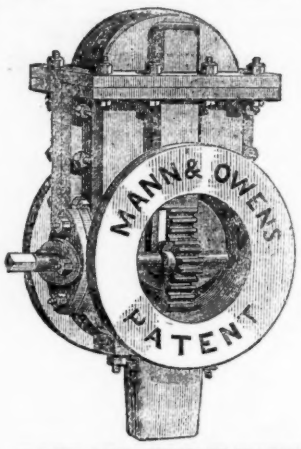
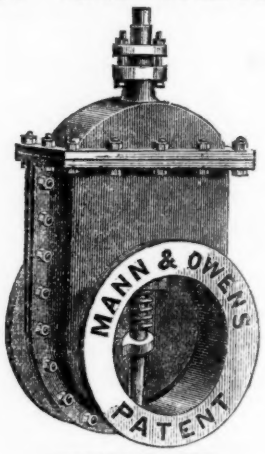
SOLE AGENT FOR ENGLAND AND WALES.

MANN & OWENS' PATENT GAS-VALVE.



RACK AND PINION VALVE.



SCREW VALVE.

The advantages of this Patent Valve over all others yet introduced are, that it is always as tight as the best wedge or spring valve, without the possibility of setting fast or becoming suddenly leaky. The surfaces not being in contact during the operation of opening or closing, leakage through wear and tear is avoided.

The Gas Engineer will not fail to see the importance of such a valve in connexion with his purifying apparatus, particularly in the case of large sizes.

The slide being operated either by a screw and nut, or by a pinion and rack, a cam bearing upon a plane, cast on the back of the Valve, forces it against the face, and renders the escape of gas an impossibility. By a slight turn of the pinion or screw, the slide is released, and brought away from the face, by which means friction is avoided, and the only force required to open the Valve is that due to its own weight.

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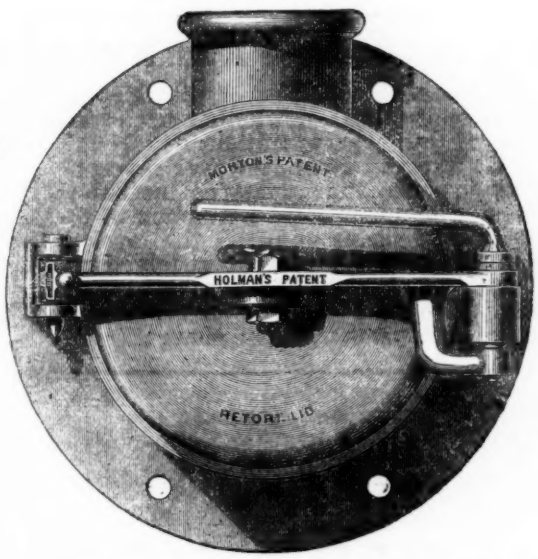

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By the employment of MORTON'S PATENT SELF-SEALING RETORT-LIDS, with HOLMAN'S PATENT ECCENTRIC FASTENINGS, the old-fashioned, cumbersome, and expensive method of sealing Retorts, by luting the lids with lime and other materials, is entirely dispensed with.

Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested, over 20,000 being in use at various Gas-Works in London and the Provinces, among which may be mentioned:—

The Gaslight Co., Beckton (where nearly 4000 are in use).
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" Gaslight Co., Silvertown.
" Gaslight Co., Lupus Street.
" London Gaslight Co.
" Independent do.
" Phœnix do.
" South Metropolitan Gaslight Co.
" Commercial do.
" Imperial do.
" West Ham Gas Co.
" Gas-Works, Barnet.

The Gas-Works, Royal Arsenal, [Woolwich.
" do. Lower Sydenham.
" do. Brentford.
" Consumers Gas Co., Woolwich.
" Alliance and Dublin Gas-Works.
" Edinburgh do.
" Manchester Corporation do.
" Salford do. do.
" Rochdale do. do.
" Liverpool Gas-Works.
" Birmingham do.
" Birkenhead do.
" Nottingham do.

The Newcastle-on-Tyne Gas-Works.
" Lurgan do.
" Carmarthen Gas-Works.
" Merthyr Tydfil do.
" Windsor do.
" Leeds do.
" St. Albans do.
" Over Darwen do.
" Rotherham do.
" Aylesbury do.
" Bournemouth do.
" Ystrad do.
" Cardiff do.
" Rochester do.

The Keighley Gas-Works.
" Aberdare do.
" Ballymena do.
" Richmond do.
" Stalybridge do.
" Longton do.
" Exeter do.
" Ross do.
" Falmouth do.
" Barrow-in-Furness do.
" Belfast do.
" Wakefield do.
And other Provincial and Foreign Gas-Works.

IMPORTANT TESTIMONIAL.

The Gaslight and Coke Company (Commonly called the Chartered Gas Company), Beckton, North Woolwich, July 2, 1874.

MESSRS. TANGYE BROTHERS AND HOLMAN.

Gentlemen,—In answer to your inquiry respecting the Self-Sealing Lids, I beg to say that they continue to work well, and I have every reason to be satisfied with them.

I should be very sorry to return to the old system of Luting, and our stokers here freely acknowledge the benefit to them of the new system.

I am, yours truly,
(Signed) G. C. TREWEY.

London 1851.

New York, 1853

Paris, 1855.

London, 1862.

Dublin, 1865

The SIX MEDALS AWARDED to THOMAS GLOVER for

PATENT DRY GAS-METERS,

The latter being the Highest Medal awarded for Dry Gas-Meters by the Imperial Commissioners for the Universal Exhibition, Paris, 1867.

Paris, 1867.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

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THOMAS GLOVER & CO.'S PATENT DRY GAS-METERS,

1st, Are a remedy for all the defects of Wet Meters;
2nd, Are suitable for all climates, whether hot or cold;
3rd, Incur no loss of Gas by evaporation;
4th, Cannot become fixed by frost, however severe;
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6th, Prevent jumping or unexpected extinction of the Lights;
7th, May be fixed either above or below the level of the Lights;
8th, Cannot be tampered with, without visibly damaging the outer case;
9th, Will last much longer than Wet Meters;
10th, Will not cost more than one-half for repair that Wet or Water Meters do;
Are upheld for five years without charge.

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(SUCCESSORS TO SAMUEL CROSLEY,)

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Established 1816.

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AND EXPERIMENTAL APPARATUS,

STREET-LAMP METERS,

AND REGULATORS FOR AVERAGE METER INDICATION.

METERS FOR MEASURING WATER.

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TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

T. M. J., Chertsey; H. G., Buenos Ayres.—*Your letters received, and are under consideration.*

THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, SEPTEMBER 5, 1876.

Circular to Gas Companies.

The announcement of the advance in the price of gas, intended to be made by the South Metropolitan Company, appears to have been received with sullen resignation. It was not at all expected, the liberality of the company being supposed to have no limits. Perhaps the fact that the notice has not, as yet, evoked any expression of opinion, may be accounted for, on the supposition that most of the local authorities are now in recess, and it may be that, at the end of the month, when they re-assemble, there will be some little uproar. The consumers will presently realize the truth that the opposition of the vestries has been far from beneficial to their interests. If the company had obtained the standard, or initial price of 3s. 9d. per 1000, they would probably have been content to go on supplying gas at 3s.; indeed, we believe it was thought, at one time, that even a lower price might be charged. The narrow margin of sixpence, however, made it the imperative duty of the directors to secure a large reserve-fund as soon as possible. With the sliding scale and so low a standard, a strong reserve, we may say, is an absolute necessity for the maintenance of dividends. The great object of all gas companies under the sliding scale must be to make what we have hitherto called maximum dividends secure with gas at the standard price. So long as that price is charged, the company can form no reserve. They may, it is true, have any amount of unappropriated balance, which is pretty much the same thing. And here let us remark, that there is now no limitation imposed on the amount of the balance of profits. When the revision clauses were law, large unappropriated funds would have been impossible. If the Act of 1868 were now in force, the Chartered Company could be compelled at once to reduce the price of gas 3d. per 1000 feet. An able writer in the *Standard*—one of a very few journalists who have really studied the metropolitan gas question—put this very clearly a few days ago. He sees plainly enough that, after all, the revision clauses afforded protection to the consumer, notwithstanding the fact, that they had never been brought into actual operation, except for the benefit of the companies. They have been got rid of just at the time they would have been useful to the consumer, and for them has been substituted a system which promises the best results to the companies. A continuation of cheap coal for a few years will place them in a position such as they never before enjoyed.

The policy which the companies will pursue under the new *régime* seems to be pretty clearly indicated. The Chartered go in for a large balance, and after they have secured that, they will, no doubt, reduce the price of gas, in order to accumulate a strong reserve-fund. So far as the South Metropolitan Company are concerned, it is easy to guess that the directors have no desire to divide the eleven per cent. they will be entitled to at the end of the first half of 1877, but that they also will seek to place their reserves in a satisfactory condition. We are somewhat curious to see what the Commercial Company will do. They must, we imagine, have a considerable balance for the past half year; but we do not suppose they will be in any hurry to reduce the price of gas, unless they see the way clear to such a reduction as will tell materially on the reserves. So far, then, we have to admit, that the sliding scale, to which we have been opposed, promises to operate for the benefit of the gas companies. Whether, when coals again become dear, it will reduce dividends, depends on the policy pursued while coal is cheap. Shareholders, we very well know, only desire the maintenance of the full dividends they have for many years received; and to secure these, as far as possible, under all circumstances, every effort should now be directed.

It is not clear what action will be taken, at the next Liverpool Quarter Sessions, with respect to the accountant's report on the affairs of the United Gas Company. Dr. Cross, the Chairman of the Special Gas Committee of the Town Council, by whose instrumentality the disturbance has been made, now issues an address soliciting subscriptions to carry on the fight against the company, the Town Council, it would appear, having no funds which they can apply to the purpose. In his circular, Dr. Cross uses some rather hard words. He, by implication, calls the United Company "grasping and unprincipled," which, considering that the directors are some of his most respectable fellow-citizens, is not proper language for the Doctor to employ. It will be time to employ such epithets when the investigation before the Recorder has proved the company to be unprincipled. At the present moment, the directors allege that they have good grounds of defence for all they have done, and they court, rather than deprecate, an inquiry. We have a strong suspicion, that Dr. Cross's application will not be liberally responded to by his fellow-citizens. The company have reduced the price of gas, and they must have done so all the same, if this agitation had not been commenced. Thus, the object of the investigation has been anticipated, and the consumers of Liverpool are now enjoying all the benefit they could derive from further proceedings. Under such circumstances, Dr. Cross will probably find his "hand and heart unstrengthened" by pecuniary support, however much public sympathy may be in his favour. It is the common experience of agitators.

The report of the meeting of the Barnet Gas and Water Company reached us too late to be noticed in our last issue, but it must not be allowed to pass without remark. It is very gratifying to see that, so far as the gas undertaking is concerned, almost everything is now in a very satisfactory condition. The demand for gas continues to increase. There is a prospect of a considerable economy in the cost of production, by the concentration of works, and further, the certainty, that with the additional appliance of an effective scrubber, something more may be made out of the residuals. All this looks well, and we hope that

every wish of the directors will be fully realized. But, with dividends of only three and four per cent., they should not hold out to their customers delusive hopes of a reduction of price. We must confess, that it was not without amusement that we read the remarks of a Lancashire shareholder, who came to the meeting provided with statistics relating to the cost of coal and gas in Wigan and Bolton, and attempted a comparison with the state of affairs at Barnet. A grosser absurdity could hardly be conceived; but the amiable chairman accepted the criticisms with his usual blandness. We must congratulate the directors on the position the company are attaining. They have struggled with much success through great difficulties, most of which have now been surmounted. The position of their gas undertaking is secure; but they have the misfortune to be water-logged. Of that, however, elsewhere.

Reports of the half-yearly meetings of provincial gas companies are now coming fast to hand. Last week we gave one, of the meeting of the Newcastle and Gateshead Gas Company, which possesses peculiar interest. They are a company with auction clauses in their Act, and the sale of shares to the amount of £25,000, entitled to seven per cent., realized premiums amounting to £7420, or about thirty per cent. According to this rate, shares in the metropolitan companies, entitled to ten per cent., may be expected to be sold at fifty per cent. premium; for it can hardly be said that any London Gas Company are in a better position than the Newcastle and Gateshead Company. The latter supply gas at a very cheap rate. After discounts have been deducted, the price is only 2s. 8½d. per 1000 feet, for from sixteen to seventeen candle gas. Nevertheless, their profits for the past half year have been very large. After paying full dividends, and carrying £2500 to a renewal-fund, they have left a balance of £4500 to carry over, which promises a further reduction of price at the beginning of next year.

The South Shields Gas Company have been hardly less successful. They can pay full dividends, and have a large balance to carry forward; and the directors are enabled to announce a reduction of threepence per 1000 in the price of gas, with the usual discounts. It is to be noticed that, in the case of this, as in that of the company previously named, they have a large amount of capital, which is practically unproductive. South Shields is under a cloud just now; but when the revival of manufacturing industry comes, the company are certain to make a rapid stride.

The Scarborough Gas Company are also able to make a satisfactory financial report. They, too, pay full dividends, and then have a balance, which is carried to the contingency-fund. In this instance, the only cloud in an otherwise bright sky are complaints of nuisance, for which the company may not be responsible. In a place like Scarborough, complaints of bad smells are very likely to be made. The inhabitants are nervously afraid of any odour that may offend the noses of the visitors; and it may be, that one of the first to complain will be a chemical manufacturer in a northern town, whose works poison the air for a mile around them. When at the seaside, however, he is strangely particular, and the slightest scent of tar or sulphuretted hydrogen offends his nostrils. The Scarborough Company are, however, doing their best to remove all cause of complaint, and, indeed, have made some sacrifice for the purpose. To conduct gas-works so as to be perfectly free from smell is an impossibility, but, with ordinary care, nothing like a nuisance need be occasioned; and then it must be understood, that the worst smell which can escape from gas-works is not at all prejudicial to health. In fact, it is a well-established fact, that, all other conditions being equal, the neighbourhood of gas-works is always exceptionally healthy.

An exception to the general prosperity is found in the case of the Wolverhampton Gas Company, who have to resort to their reserve-fund to make up full dividends. The causes are sufficiently clear. Unfortunate coal contracts, a fall in the value of coke, and a considerable addition to the capital account, have combined to bring about this state of affairs. The directors are to be commended for not having raised the price of gas under the circumstances. The current half year's working, with reduced rates for coal, will, do doubt, set the matter straight.

The Town Council of Hanley are extremely anxious to acquire the Etruria works of the British Gas Company, and the latter are resolute in their determination not to sell. Under such circumstances, the only course for the Council is to go to Parliament with a Bill to effect a compulsory purchase, and take their chance. They may succeed, but it is more likely they will not. We advise the Council not to rely too much on "precedents." In the case of a Parliamentary Committee, it is a mere "toss "up" which way their decision will go. Something may be guessed when the committee are nominated, but then the nomination is a matter of chance.

As our readers may remember, the Town Council of Longton, some time ago, agreed to purchase the undertaking of the Longton Gas Company, but the Council do not appear to be in funds, and now are asking for an extension of the time to complete the purchase. This the company have readily granted, but the opportunity has been taken of revising the terms, inasmuch as the value of the undertaking has increased while the negotiations have been pending. In effect, the company now ask the Council for £4000 more than they originally agreed to sell the works for. As yet, we are in ignorance of what the Council say to the demand.

Water and Sanitary Notes.

THE correspondence published in the daily papers at this time of the year—not inappropriately termed the "silly season"—is of varied interest, and of very unequal merit. As a matter of course, the discussion of sanitary matters occupies a good deal of space—not so much as it would, however, if "Bulgarian atro-"cities" did not constitute an attractive theme for philanthropic writers. It has not yet been suggested that "sewer gas," defective drainage, and a bad water supply—just now prominent subjects of discussion—are fertile sources of what we may call the massacre of Western Christians; but the allegation might be made with a good show of reason. We forget how many, but we believe that 70,000 deaths in England, are annually ascribed to what are called preventible diseases; but we have no indignation meetings to protest against such a wanton sacrifice of life. There is plenty of sympathy displayed for those *innocent* people who, by a figure of speech, are called Eastern *Christians*, but very little is shown for the village heathen in this country, who, every summer and autumn, suffer from drought, and habitually, and of necessity, drink most polluted water.

We are glad, therefore, to see the correspondence in the leading journal, relating to the water supply of our villages. In most cases, we believe that an ample and good supply might be found, if only care were taken to husband it. Rain water might, no doubt, be collected with advantage; but for other than purposes of ablution, it is, to our minds, utterly detestable. We prefer, for all other uses, a moderately hard water, which is to be found, we believe, in nine cases out of ten. But who is to collect, purify, store, and distribute this invaluable blessing? Clearly, the miserable villagers cannot be put to the expense, and the landowners around will seldom help them. They do so, it must be said in fairness, sometimes most generously. But the time is coming, if not already come, when some universal action must be taken with regard to the water supply. Every year we find sources of water which naturally belong to one district, appropriated by another, or, at all events, an attempt is made, which leads to a long and expensive parliamentary contest.

It has been more than once urged in these columns, that England requires mapping out afresh, with especial reference to its physical geography. We have all sorts of units of area, but what is required is that the kingdom shall be plotted out in areas for drainage and water supply. On this point we need make no excuse for quoting the opinion of our eminent contemporary, the *Saturday Review*, who writes as follows:—

> It is not often that the appointment of a Royal Commission is the appropriate remedy for a public evil, but in this case it, for once, is so. A practical scientific Commission would be able, in no very long space of time, to map out the entire country. . . . When such a Commission had made its report, the Local Government Board would know, of every village in England, whether any improvement in the water supply was required, and by what means, and at what cost, it could be most efficiently effected. Possessed of this information, they would be in a position to say to each separate local authority, "This is what has to be done. . . . . If the cost is beyond what is reasonable to impose upon you, you shall be helped; but neither resistance nor delay can be any longer tolerated."

Our readers know the detestation we have for Royal Commissions, but, in the case suggested, the inquiry need not be a long one. Almost all the data required will be found on the Ordnance maps, and in the tables of population.

We meant to have said something respecting sewer gas, but our space is exhausted, and we must leave the matter until next week.

We may here make a brief reference to the affairs of the Barnet Water Company, who are not so prosperous as we could wish. If the company are really distributing 38½ gallons per head per day, there must be something wrong somewhere. The quantity is far beyond all possible requirements, and we may estimate that at least two-thirds of it runs to waste. This is a matter the directors should look after at once. The general Acts give a company ample powers for the prevention of waste, from defective fittings in houses, and it is a mistaken charity which overlooks these defects. The state of dampness produced by the incessant dribbling of water in a house is eminently prejudicial to health. Watery vapour takes up organic poisons like a sponge, and probably there is no such prolific source of disease as a damp foundation. For the sake of their customers, the company should do their utmost to prevent the waste of water. In all probability, a good deal of water is, at this season of the year, devoted to the

watering of gardens. We do not know the hours of supply at Barnet, but the chances are that a consumer often empties his cistern in watering his garden in the evening, and next morning, finding that he has not enough water to fill the kettle for breakfast, he sits down and writes an angry letter of complaint to the company. We need not allude to other causes of waste which the company have power to rectify. Ten gallons per head is an ample supply for an essentially rural population like that of Barnet. If the company supplied twenty, it would be in excess of all reasonable needs; and if the directors devoted their energies to the prevention of waste, their present appliances, including the doubtful pump, would be ample for some years to come.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

CVII.

Frankland and Ward's Gas Analysis Apparatus.

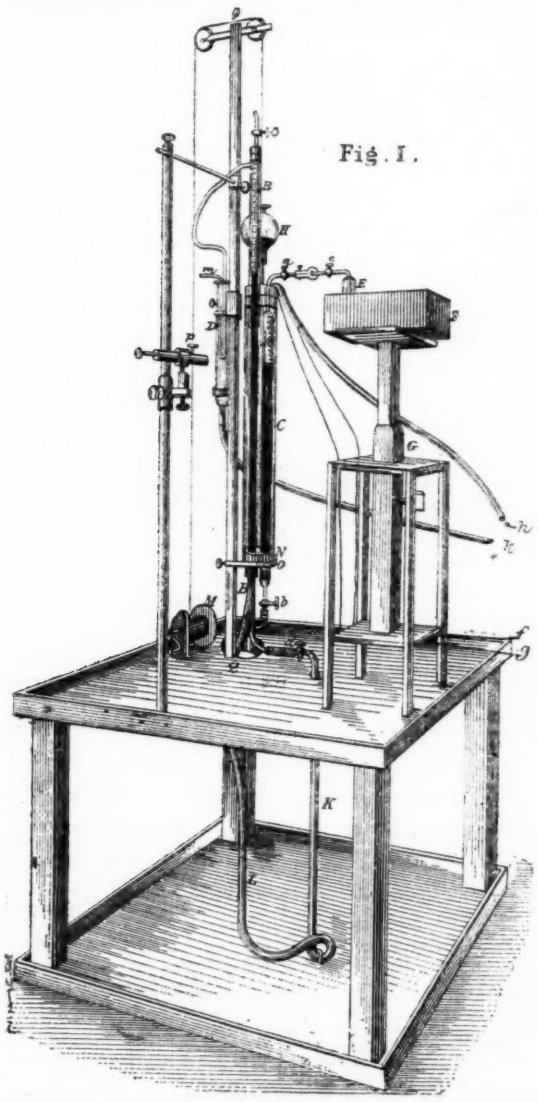
Many improvements have been proposed, from time to time, to render the important operations of gas analysis at once accurate and speedy.

Bunsen was the first to take up this subject in a thorough manner, and his method leaves little to be desired in point of accuracy; it occupies, however, too much time to be of general value.

Russell and Williamson produced, in 1864, an apparatus eliminating many of the tedious calculations inseparable from Bunsen's method ("Proceedings of the Royal Society," vol. ix., p. 218, and *Chem. Soc. Jour.*, vol. xvii., p. 238); and later, in 1868, the former of these two chemists so modified the apparatus as to be able to finish an analysis in much less time. (*Chem. Soc. Jour.*, vol. xxi., p. 128.)

But the right direction was first taken by Regnault and Reiset some time before, in 1849 ("*Ann. Chem. Phys.*" (3), vol. xxvi., p. 333), though in their apparatus accuracy was sacrificed to speed.

Fig. 1.



Their apparatus was improved by Frankland and Ward in 1854, and much more accurate results were then obtained. (*Chem. Soc. Jour.*, vol. vi., p. 197.) And it is this apparatus, with some modifications introduced by Macleod in 1869 (*Chem. Soc. Jour.*, vol. xxii., p. 313), that we purpose to describe here.

The apparatus consists essentially of two long glass tubes connected together at one end, but separated at the other.

One is the eudiometer or "measuring-tube," the other is the "barometer-tube" or "pressure-tube."

All absorptions are done in a separate vessel, the "laboratory-vessel," which is connected to the top end of the eudiometer by a capillary-tube.

The *eudiometer* (A, fig. 1) is a glass tube about 900 m.m. (35 inches) long, and 22 m.m. (0·86 inches) in internal diameter.

It is graduated downwards, the interval between the top and the first division being 25 m.m. (1 inch), between the first and second divisions 50 m.m. (2 inches), and between all the rest 100 m.m. (4 inches).

The upper part is drawn out and attached to a capillary tube, which is bent at right angles about 50 m.m. (2 inches) above the top of the eudiometer, and which has a glass stopcock (*a*, fig. 1) attached to it.

The bottom end of the eudiometer is drawn out, and a capacious glass stopcock (*b*, fig. 1) joined to it; the continuation of the tube then bends round and joins the barometer-tube. Two platinum wires are fused into the eudiometer near its upper end, and have a small interval between them. They are attached externally to two insulated wires (*f*, *g*, fig. 1) from an induction-coil, not shown in the figure. By this arrangement a spark can be passed between the two platinum wires whenever desired.

Fig. 2.

The *barometer-tube* (B, fig. 1) is about 8 m.m. (0·3 inch) in diameter, and 1200 m.m. (47 inches) long; it terminates at its upper end in a stopcock, or, better, a ground glass plug, made air-tight with resin-cerate and mercury (fig. 2).

It is graduated down its entire length in millimètres.

The lower end of the barometer-tube, below its junction with the eudiometer, is connected with caoutchouc tubing, strengthened with a covering of tape to a stopcock at right angles to it (*d*, fig. 1). From this a long and narrow glass tube passes to about 750 m.m. (29½ inches) below the table (K, fig. 1), and the end of this tube is connected with a long piece of caoutchouc tube, also strengthened with a covering of tape. This tubing may be made by sewing a piece of tape round ordinary caoutchouc tubing; or caoutchouc tubing with canvas woven into its substance, and known as "mercury tubing," may be employed.

This long piece of caoutchouc tubing is in connexion with a glass globe—the "reservoir"—(H, fig. 1), which can be raised or lowered by means of a little windlass (M, fig. 1).

The eudiometer and barometer-tube are kept in their places by means of a clamp (*o*, fig. 1), moveable upon a strong iron rod 25 m.m. (1 inch) in diameter, firmly fixed to the table. They are surrounded by water, contained in a broad glass tube 60–70 m.m. (2½ inches) in diameter (C, fig. 1), closed at the bottom with a caoutchouc stopper, through which the tubes pass.

To maintain this water at an uniform temperature throughout, a constant stream of water from the main is kept running through it. The water enters by a tube (*h*, fig. 1), which goes quite to the bottom of the cylinder, and flows away by the syphon arrangement (D, fig. 1) from the top. The smaller tube serves to surround the whole of the barometer-tube with water, and so keep it at a constant temperature. The syphon can be started by applying suction to the bent tube (*m*, fig. 1). The temperature of the water surrounding the tubes is not only always uniform, but often remains constant during a whole analysis.

The *laboratory-vessel* (E, fig. 1) in which the absorptions are done is made of glass, and is 100 m.m. (4 inches) high, 35 m.m. wide (1·4 inch) inside diameter, and has a capacity of about 120 c.c. (about 1-5th of a pint). It is connected at one end to a capillary tube, bent at right angles, having a stopcock (*e*, fig. 1) fixed in it. To the end of this capillary-tube is cemented a steel cap, 10 m.m. (0·4 inch) long, and 8 m.m. (0·3 inch) diameter across the face (fig. 3A).

A similar cap is fixed to the capillary-tube of the eudiometer, and the faces of both are polished so as to fit accurately.

Fig. 3

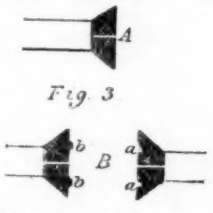
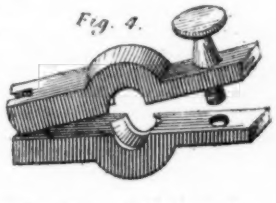


Fig. 4.



The two caps are secured together by a steel clamp, shown in fig. 4.

Professor Bischoff has lately introduced an improvement in the construction of these steel caps. He makes a circular groove (*a*, fig. 3B) in one, and a corresponding ridge on the other (*b*, fig. 3B). When such caps are clamped together with cerate an air-tight joint is much more easily obtained than with the old caps.

The open end of the laboratory-vessel rests in the mercury trough (F, fig. 1), which latter is of peculiar construction.

It is a solid block of mahogany, 270 m.m. (10½ inches) long, 80 m.m. (3⅛ inches) broad, and 90 m.m. (3½ inches) deep, outside measurement. A rim (*b b b b*, fig. 5) runs round it, 8 m.m. (0·3 inch)

Fig. 5

broad, and 18 m.m. (0·7 inch) deep. The cavity (*a*, fig. 5) is 235 m.m. (9¼ inches) long, 25 m.m. (1 inch) broad, and 65 m.m. (2½ inches) deep; a circular depression (*c*, fig. 5) is made at one end, 45 m.m. (1·7 inch) in diameter, and 14 m.m. (½ inch) deep, to receive the laboratory-vessel. Two lateral depressions (*d d*, fig. 5) near the other end serve for a capsule and tube, containing the gas to be decanted into the laboratory-vessel. Fig. 5 shows the construction of the trough in plan, and section.

The trough rests upon a telescope-table (G, fig. 1), the height of which must be so adjusted as to have the caps of the laboratory-vessel and the eudiometer exactly coincident when the former is in position.

When the apparatus is to be filled with mercury all the stopcocks are opened, and the reservoir lowered to the ground. The reservoir is then nearly filled with mercury, and gradually raised. The eudiometer and barometer-tube then fill with mercury, and when all air has been expelled, the stopcocks of both (*a* and *c*, fig. 1) are closed.

The interior of the eudiometer and barometer-tube must now be moistened with water; to do this a short wide piece of caoutchouc tubing is slipped over the end of each tube, the other end dipping into a vessel of water. Then, on lowering the reservoir, and gently opening the stopcocks (*a* and *c*), a little water is forced into the two tubes by the excess pressure. To expel the excess of water and any remaining air, the reservoir is first raised, so that the mercury flows out at the open stopcocks (*a* and *c*); these stopcocks are then closed, and the reservoir lowered to the ground, when any air that may be in the apparatus bubbles above the surface of the mercury in the eudiometer and barometer-tube, and is expelled by again raising the reservoir. This series of operations is repeated until every trace of air has been got rid of.

It is now necessary to ascertain the height of the mercury in the barometer-tube corresponding to each division of the eudiometer. Both tubes being quite full of mercury, and the stopcocks (*a* and *c*) closed, and (*b* and *d*) open, the reservoir is gradually lowered. When the mercury in the eudiometer exactly coincides with the first mark upon it, the stopcock (*d*) is rapidly closed, and the height of the mercury in the barometer-tube observed; this is continued for every other division on the eudiometer.*

These and all other readings are performed by means of a telescope (P, fig. 1) of short focus, sliding up and down a vertical rod.

A piece of black paper is made to slide up and down the cylinder (C), to which it is fastened by a piece of elastic surrounding it. When a reading is to be taken, this piece of paper is placed about a millimètre above the level of the mercury. It much facilitates a correct reading by preventing any reflection of light from the surface of the mercury. All readings are to be taken from the top of the meniscus of the mercury.

Before proceeding with an analysis, the eudiometer must be calibrated. The tube is first filled with pure water, and then, the stopcocks (*a*, *b*, and *d*) being open, the reservoir is raised a little, so as to gently eject the water from the eudiometer, until the top of the mercury exactly coincides with the lowest mark on the eudiometer, when the stopcock (*b*) is closed.

A small light flask, which has previously been carefully weighed, is suspended over the end of the eudiometer, so as to catch any water that may be expelled from the eudiometer, when the reservoir is raised and the stopcock (*b*) gently opened. Great care must be taken that the water does not issue too violently, or some will certainly be lost by spirting. The water is allowed to drop into the flask until the mercury in the eudiometer reaches the next division on the tube. The stopcock (*b*) is then closed, the flask and water removed and carefully weighed. At the same time the temperature of the water in the outside cylinder (C) is observed.

From these data the actual volume of the space in the eudiometer between the two marks is easily found. The process is continued up the eudiometer for each of its marks, and a table something like the following is obtained. No correction for the tension of the aqueous vapour in the eudiometer need be made, as there is the same tension in the barometer-tube (both tubes being at the same temperature), and, therefore, the tension in one tube exactly counterbalances that in the other. This remark applies to every reading, as all gases are measured moist and the barometer-tube is always kept moistened with water.

Division on Eudiometer.	Corresponding Height of Mercury in Barometer-Tube.	Contents in Cubic Centimètres.	Log of Contents.
1.	904·5 ..	9·0234 ..	0·9953702
2.	854·6 ..	18·5321 ..	1·2679223
3.	754·5 ..	37·6437 ..	1·5756958
4.	654·5 ..	56·7329 ..	1·7538357
5.	554·4 ..	75·8251 ..	1·8798124
6.	454·5 ..	94·9243 ..	1·9773760
7.	354·5 ..	113·9928 ..	2·0568810
8.	254·3 ..	133·1520 ..	2·1243477
9.	154·4 ..	152·2631 ..	2·1825944

Care must be taken not to raise the reservoir too rapidly when the apparatus is free from air, otherwise the concussion of the mercury against the top of the eudiometer and the barometer-tube may determine their fracture.

(To be continued.)

* It is a great advantage to make this stopcock (*d*) of steel, and to attach a long lever to it, so that the mercury may be observed through the telescope and the stopcock opened or shut at the same time.

SUPPLEMENTARY CHAPTERS.—RETORT-SETTINGS, No. 3.

The full-page engraving accompanying this number represents two different methods of setting five retorts in a bench, one method being illustrated in the upper, and the other in the lower figures. In both, the absence of transverse walls will be remarked—a system of setting to be recommended whenever good retorts, that will not break by the action of heat, can be obtained.

Fig. 1 is a front view, with half the front wall removed for the purpose of showing the interior. Fig. 2 is a longitudinal section, and fig. 3 the plan with the arch removed.

The two lower retorts are placed upon the flues, *o*, which extend from within a few inches of the front wall to the vertical flues communicating with the main flue, indicated in plan on fig. 3, and by the dotted lines on fig. 2.

The upper side retorts are supported by fire-clay saddles, or quarries, placed at intermediate distances, the spaces between them being filled throughout with soap bricks, or brick on edge, according to the width of the space. By these means the current of caloric is prevented from passing at these points. There is also another line of bricks placed between the retort and the arch, marked *h*, extending from the front wall to within a foot of the back wall, thus leaving an orifice of that length at each side for the passage of the current. These are not shown in fig. 3, in consequence of the section being below that point.

The heat, as generated in the furnace, F, is conducted directly to the whole of the retorts, the lower ones being protected at the point C from its most vivid action. The current of heat passes in the direction of the arrows, through the orifices at the ends of the partition, *h*, returns into the space, *b*, enters the flue, *o*, and thence passes to the vertical flues.

This setting is very economical, as regards the consumption of fuel; but for its satisfactory adoption, good retorts are, as we have already said, indispensable. The retorts are 21 by 14 inches by 8 feet or 8½ feet long internally, which dimensions and form, we believe, are most suitable for works of every denomination, as from their area they are capable of receiving large charges, and are easily drawn—two important considerations as effecting economy of labour in carbonization.

The second method differs slightly from the first, and is one which has been adopted by a gentleman in the North, whose carbonizing accounts show a greater return upon the coal consumed than those of any other engineer of our acquaintance.

In fig. 4, it will be observed that a large portion of the lower retort is exposed to the most vivid action of the heat, and although this, in our opinion, cannot be recommended, we are assured that the retorts are not injured by this close contact with the fuel. This is a theory which is supported by a well-known engineer of ability, who states that, under like conditions, the coal within the retort tends to preserve it, by the quantity of caloric being continually carried off by the gas.

The principal difference between this setting and that first described consists in dispensing with the piers for supporting the top retorts, which repose on slabs shown in section fig. 5, and in plan fig. 6. These slabs are laid on the upper retorts, leaving a space of about 18 inches long at the end. There are also partitions between the lower retorts as well as at the sides, so arranged that the current must pass to the end of the slabs before it can return to the flue, *o*. The action being, with one exception, identical with that described, need not be repeated. That exception is, that whereas, according to the first system, the current passes from the flue, *o*, to the vertical flues, in this it passes at once to the main flue, without the intervention of a damper.

DEATH OF MR. THOMAS PEACOCK, OF MANCHESTER.—We (*Manchester Guardian*) regret to record the death of Mr. Peacock, who was widely known in his official capacity as indoor superintendent of the gas department of this city. He had been connected with the corporation for many years. He was first appointed as assistant committee clerk to Mr. Martin, and on the election of that gentleman to the city treasurership, Mr. Peacock became his successor. Diligent and painstaking, he secured the confidence of the council, and was afterwards entrusted with the important office which his death has rendered once more vacant. His duties became thus more onerous, and his responsibilities largely increased; and there is little doubt that his constitution, never robust, was overtaxed and strained. His health had long been unsatisfactory. In the spring of the present year the Gas Committee generously released him for two months rest and change, and he returned to his duties with recruited energies. On Friday, he transacted business as usual at the town-hall, but became seriously ill in the evening, and died early on Saturday morning. He was in his 51st year.

REDUCTIONS IN THE PRICE OF GAS.—The directors of the Sunderland Gas Company, in their report, to be presented at the annual meeting of shareholders to-morrow, announce a further reduction of 3d. per 1000 feet on all gas which may be consumed after the commencement of next quarter. At Weston-super-Mare the price has been reduced from 4s. 9d. to 4s. 6d., with discounts as before, varying from 5 to 15 per cent. At the monthly meeting of the Belfast Town Council last Friday, it was agreed to make a further reduction in the price of gas—namely, from 4s. 2d. to 3s. 11d. per 1000 cubic feet, the reduction to take effect from the 1st of July last.

PROPOSED REDUCTION OF GAS-RATES IN MANCHESTER.—At the City Council meeting to-morrow, the Gas Committee will ask for authority to reduce the price of gas within the city to the uniform rate of 3s. 4d. per 1000 cubic feet, instead of 3s. 6d. and 3s. 5d., the latter being the price charged to consumers of 500,000 cubic feet in one quarter. The rates outside the city, excepting New Moston and places beyond the river Mersey, will be reduced from 4s. 2d. and 4s. 1d. to 3s. 10d. uniformly per 1000 cubic feet, and in the district of Cheadle from 4s. 16d. and 4s. 9d. to 4s. 6d.; Northenden, from 5s. 4d. and 5s. 3d. to 4s. 6d. uniformly; New Moston, from 5s. 10d. and 5s. 9d. to 4s. 6d. uniformly; and Droylesden, from 4s. 8d. to 3s. 10d. without any deduction for early payment.

Correspondence.

FRANKLIN'S PATENT GAS-REGULATOR.

SIR,—In answer to Mr. Peebles's letter of the 24th inst., I am sorry that I am not able to give him the exact date of the introduction of the "Franklin Regulator," to which I alluded in my last, but think I shall not be far wrong if I put it at about sixteen years ago, since which time many have been sold and fixed. They were not the invention of a *Mr.* Franklin, but introduced by *The Franklin Patent Furnace and Machine Company*, under the name of "The Franklin Patent Gas-Regulator." I am not aware of any instance of their being fixed as *station governors*, but many have been sold and fixed as service regulators. On reading your report of Mr. Peebles's invention, I was struck by the similarity of his valve arrangement to that of the Franklin, and, on reference, found that the plan of sealing the valve, in order, by preventing a direct pressure of gas underneath the bottom of the valve, to do away with pulsation or "bobbing," formed one of the chief features of the "Franklin Regulator."

I shall be most happy at any time to show Mr. Peebles one of these regulators, or perhaps he may be able to obtain one from Messrs. Deane and Davies, 21, Blackfriars, Manchester, who formerly did a large trade in them.

ALBERT H. HEWARD.

177, *Stanhope Street, N.W., Aug.* 30, 1876.

Parliamentary Intelligence.

GAS AND WATER WORKS FACILITIES ACT, 1870.

PROCEEDINGS UNDER THE ACT DURING THE SESSION OF 1876.

The Board of Trade have issued their Annual Report on this subject, from which it appears that 24 notices of intended applications for Provisional Orders, under the above-mentioned Act, were advertised and deposited at the Board of Trade in 1875 in respect of gas and water. Only 23 applications, however, were actually made to the Board of Trade—viz., 12 in respect of gas, 8 in respect of water, and 3 in respect of gas and water combined. All the applications in respect of gas and gas and water combined were granted. Of the 8 applications in respect of orders relating to water-works, 7 were granted, and one was refused. The fees received with these applications (including also 7 for tramways), amounted to £1050. Counsel's fees for settling the 28 orders, drawing the 4 Confirmation Bills, and other expenses, amounted to £368 17s. 10d., leaving a balance of £681 2s. 2d.

GAS ORDERS.

Of these, six—viz., Brentford, Chapel-en-le-Frith, Cromer, Hythe and Sandgate, Poole, North Ormesby, were for the maintenance, continuance, and enlarging of existing works; one—viz, St. Anne's-on-the-Sea, was for the construction of new works; and five—viz., North Middlesex, Retford, Risca and Pontymister, Tottenham and Edmonton, Worksop, were for raising additional capital.

Opposition was offered to four of the applications—viz., Brentford, Chapel-en-le-Frith, Hythe and Sandgate, and Poole.

With respect to the Brentford Gas Order, there was but one objection, but as the promoters did not seek for power to erect gasholders or to manufacture gas or residual products on lands other than on the lands authorized by the company's Acts of Parliament, the Board of Trade were unable to entertain the objection.

The application by Mr. Gaskell, in the case of the Chapel-en-le-Frith Gas Order, to maintain and enlarge the existing gas-works, was opposed by the local authority, by one of the road authorities, and by certain of the inhabitants. As it was represented to the Board of Trade that the existing gas-works had been in operation for 30 years, that there was no nuisance, and that the local authority wished to establish gas-works themselves, it appeared to the Board of Trade that a public inquiry should be held under the Gas and Water Works Facilities Act, 1870, Amendment Act, 1873, with a view to considering whether this was a case in which it would be desirable that the consent of the local and road authorities should be dispensed with. Colonel Hutchinson was accordingly appointed to hold an inquiry at Chapel-en-le-Frith. He reported that an agreement had been come to between the promoters and the local authority for the sale of the gas-works to the latter if required by them, and he recommended that the order should be granted. The opposition having been withdrawn, the Board of Trade granted an order, and inserted a proviso to the effect that if within 12 months from the passing of the Act confirming the order, the town of Chapel-en-le-Frith shall be formed into an urban sanitary authority, the promoter shall within such period sell the undertaking to the urban authority if required by them.

In the case of the Hythe and Sandgate Order, the Admiralty objected that the site was in close proximity to the buildings of the coastguard station at Hythe, and suggested that some other site should be obtained. Colonel Hutchinson was appointed to hold a public inquiry at Hythe, and reported that the promoters had shown good reason for objecting to the sites proposed by the Admiralty, but that they were willing to agree not to erect any works other than gasholders within a certain distance of the coastguard station. This proposal having been submitted by the Board of Trade to the Admiralty, an agreement was ultimately come to between them and the promoters to this effect; thereupon they withdrew their objections, and the Board of Trade granted the order.

In the case of the Poole Gas Order, to maintain and continue existing gas-works, the application was opposed by the Corporation of Poole, who had applied to the Local Government Board, under the Public Health Act, 1875, for a Provisional Order to erect new works. As it had been represented to the Board of Trade that the company had supplied gas for a period of 40 years, and that they had offered to sell their works to the corporation at a price to be fixed by arbitration, and that this offer had not been accepted by the corporation, the Board of Trade saw no sufficient reason for refusing to comply with the application, and the order was accordingly granted.

A petition against the Poole Gas Order was presented in the House of Lords on behalf of the Corporation of Poole. The bill was consequently referred to a select committee, who, however, reported the bill without amendment.

In the case of the North Middlesex Gas Order, application was made to raise additional capital by shares, and to create debenture stock. As the company had been formed under the Joint-Stock Companies Act of 1862 (which gives no power to a company to create debenture stock), it appeared to the Board of Trade that they would be giving the company a power which was not contemplated by that Act; they accordingly declined to give the company power to create debenture stock, but authorized them to raise additional capital.

General Observations.

The dividend on additional share capital has been limited in all the Gas Orders of 1876 to 7 per cent. on the ordinary, and 6 per cent. on the preference capital.

The illuminating power of the gas is fixed at a minimum of 14 candles, and the maximum price varies from 5s. to 7s. 6d. per 1000 cubic feet.

The pressure is fixed in all cases at 6-10ths of an inch by day, and 8-10ths by night. Special authority is also given to the gas examiner to open any road or street for the purpose of testing the pressure.

WATER-WORKS ORDERS.

Of the seven orders relating to water undertakings granted, three—viz., Flamborough, Newbury, Wantage, were for the construction of new works; one—viz., Chiltern Hills, for an extension of the existing works; and three—viz., Neath, Stockport District, Wisbech, for additional capital. One of them was opposed—viz., Neath; and one order was refused—viz., Leatherhead District.

In the case of the application for the Leatherhead District Water Order, the consent of the local and road authorities was refused, and opposition was offered by the parochial committee and certain inhabitants, who stated that a system of drainage should precede the water scheme, and that the local authority are the proper persons to supply the water. They further stated that they intend to supply it as soon as a system of drainage was established. Memorials were received by the Board of Trade in favour of, and against, the application. As it was represented to the Board of Trade, on the part of the promoters, that the present supply was contaminated with sewage, and that the local authority had not availed themselves of the power to supply water, the Board of Trade appointed Colonel Hutchinson to hold a public inquiry at Leatherhead, for the purpose of ascertaining whether this was a case in which it would be desirable that the consent of the local and road authorities should be dispensed with. Colonel Hutchinson reported that in his opinion the drainage and water schemes should be undertaken concurrently, and that the local authority might be trusted to take up the subject of water supply as soon as the question of outfall for the drainage had been settled. Under these circumstances, the Board of Trade declined to dispense with the necessary consents, and the order was not granted.

In the case of the Neath Water Order, power was sought to amalgamate the Neath undertaking with the Briton Ferry undertaking, and to form the separate capitals appropriated to each undertaking into one capital. The Corporation of Neath, who, it appeared, had been before Parliament for compulsory powers to purchase the company's undertakings, but had not been successful, opposed the application. It appeared to the Board of Trade that, as the company were desirous of remedying the evils complained of by the corporation, the application for additional capital should be granted. An order was accordingly granted, authorizing the additional capital, and the application of it to the purposes of the Briton Ferry undertaking only; the dividend on the additional capital being limited to 7 per cent. on ordinary capital, and 6 per cent. on preference capital. The Board of Trade, however, declined to authorize any amalgamation of the two undertakings, or of their capital powers, both of which are, by Act of Parliament, required to be kept separate.

With respect to the Newbury Water Order, after the order had been made the local authority, who had given their consent on certain conditions, one of which was that the order should be subject in all respects to the provisions of the Water-Works Clauses Act, 1847, objected to the clause in the order which provides that section 44 of the above-mentioned Act shall, for the purposes of the order, have effect as if the words, "with the consent in writing of the owner or reputed owner of any such houses, or of the agent of such owner," were omitted therefrom. The corporation also objected to the clause which provides that the incoming tenant shall not be liable to pay arrears left unpaid by a former tenant. As these are the usual clauses adopted by the Board of Trade and by Parliament, the Board of Trade declined to make any exception in this particular case.

In the case of the Wantage Water Order, opposition was offered by Mr. Worthington, a landowner, who objected to any pipes being laid on his property; and by certain millowners, who stated that the supply to their mills would be diminished. To enable the Board of Trade to judge of the sufficiency of these objections, they appointed Colonel Hutchinson to hold a public inquiry at Wantage. He reported that it was admitted there was a great need of pure water, and that the most available source was that from which the promoters proposed to take it; that the loss the millowners might suffer from the abstraction of water would, in his opinion, be inappreciable, and he recommended that the order should be granted. This was accordingly done; but a clause was inserted to the effect that the promoters should not lay any main-pipes, or execute any other work upon the property of Mr. Worthington, without his consent.

GAS AND WATER (COMBINED) ORDERS.

Of the three Gas and Water (combined) Orders, two—viz., Clacton-on-Sea and Connah's Quay, were for the construction of new works; and one—viz., Flint, for the maintenance and continuance of existing works, and the construction of additional works.

In the case of the Connah's Quay Gas and Water Order, Mr. Hills, of the Wepre Brook Chemical Works, opposed on the grounds that the abstraction of water from the Broad Oak Brook would diminish his supply of water, and would cause a silting up of the Wepre Brook, thereby preventing vessels coming up to his works. In order to consider the merits of the case, the Board of Trade appointed Colonel Hutchinson to hold a public inquiry at Connah's Quay, and he reported that Mr. Hills's interests were not likely to be affected by the abstraction of water, but that the silting up of the brook was a question which only experience could decide; and he recommended that the order should be granted, with a clause to protect Mr. Hills in case a silting up of the brook should occur. The Board of Trade accordingly granted an order, and inserted a clause to the effect that the promoters should repay any expenses incurred by Mr. Hills in keeping open the mouth of the Wepre Brook in the event of an accumulation of sand caused by the abstraction of water from the Broad Oak Brook, and that any difference between the parties should be decided by an arbitrator appointed by the Board of Trade.

The remaining Gas and Water Orders do not appear to require any special remarks.

The two Gas and Water Orders Confirmation Bills were introduced into the House of Lords and respectively read the first time on the 7th and 28th of April.

In the House of Commons there was no opposition, and the two bills eventually received the Royal Assent on the 27th of June and the 13th of July.

Legal Intelligence.

MIDDLESEX SESSIONS.—TUESDAY, AUG. 29.

(*Before Mr.* P. H. EDLIN, *Q.C., Assistant-Judge.*)

CONVICTION FOR STEALING GAS.

William Rowley, of No. 10, Olive Place, Kentish Town, was indicted for stealing 3680 feet of gas, value 13s. 6d., the property of The Gaslight and Coke Company.

Mr. GATES, Q.C., and Mr. WILLOUGHBY appeared for the prosecution; Mr. WARNER SLEIGH defended the prisoner.

Mr. GATES, in opening the case, said the prisoner was a carpenter by trade, and on the 9th of September, 1869, came into possession of the premises, No. 10, Olive Place, Kentish Town. On the 1st of October in the same year he entered into a contract with the gas company for the supply of gas for three burners, to be used in a small parlour and a workshop at the back. The business in the house was formerly carried on by a Mr. Walker, and his consumption for eight burners in the winter quarters of four years was as follows:—In 1866, 9200 feet; in 1867, 4300; in 1868, 5400; and in 1869, in which year the

prisoner commenced his first quarter, 5100 feet. At the Christmas quarter of 1870, however, the consumption, as recorded by the meter, rapidly diminished, for at that time it went down to little over 1000 feet, and for the two following years it remained at much the same amount, ranging from 1200 to 1800 feet. In 1874 the company placed a new meter in the house, thinking that there might be something wrong with the old one on account of the small quantity of gas that was recorded in comparison with what there was before. Almost immediately after this the consumption rose to between 6000 and 7000 feet for the quarter ending December, 1874, although the previous quarter the meter only recorded a consumption of 1000 feet. As soon as confidence appeared to be re-established in the mind of the prisoner, the consumption of gas recorded by the meter again fell off. Although he then had in use 15 burners, his contract with the company was for the supply of three burners only; he also had had a gas-stove, a circumstance which naturally greatly excited the suspicions of the company. However, they had no power to search the house, but on the 3rd of June resorted to the expedient of placing a test-meter down in the street, for the purpose of ascertaining the precise quantity of gas that was consumed in this house alone. That test-meter was put done on the 3rd of June, and an account of it was taken on the 24th, and showed that for 21 days the quantity of gas that had passed through it and been consumed on the prisoner's premises amounted to 2948 feet, while the house-meter only recorded that 1800 feet had been consumed. On the 31st of July the account was again taken of the test and house meters, and on this occasion the house-meter showed that for five weeks 700 feet only of gas had been consumed, while the test-meter recorded that actually no less a quantity than 4380 feet had been consumed. When this disparity was discovered, search was made in the premises by an inspector of the company. In the parlour of the house was found a sliding panel, and behind it were private pipes under the floor of the parlour, communicating with the main service-pipe, and from which a supply of gas could be obtained without it passing through the meter. It was also found that a surreptitious supply of gas was thus procured for the use of the stove. The inspector was accompanied by several workmen, and to ascertain the real state of the case it was directed that the supply of gas should be turned off at the house-meter, an arrangement which, under ordinary circumstances, would have caused all the lights to go out; but although this was done, the lights still continued burning, as they received their supply from the surreptitious pipes. By taking up a trap-door in the front parlour the prisoner could get at a tap, and thus he was enabled to let as much gas as he liked go through the meter, or through the private pipes without passing the meter at all. From the appearance of some of these private pipes they had been used for a considerable time, while others were comparatively new, and there could be no doubt that a quantity of gas had been consumed without being registered.

The evidence was reported when the case was before the Marylebone Police Court, on Aug. 3, and several witnesses having now been examined,

Mr. SLEIGH said that after watching the evidence to the best of his ability, and taking advantage of everything he could in the interest of his client, he had come to the conclusion that it would be hopeless on his part, on the evidence produced, to struggle against a verdict of "Guilty," and therefore he had advised the prisoner to withdraw his plea of "Not Guilty" and plead "Guilty" to the indictment. He might say that his client was a man of the highest respectability, and a gentleman was present to speak to his character. As for the prosecution, he (Mr. Sleigh) and the prisoner also felt that the company could not have taken any other course, and they acknowledged the fairness with which it had been conducted. The prisoner, therefore, threw himself upon the mercy of the court. He had a wife and children who must become dependent upon friends for their support, and he had lost his character and position; but he hoped that while his lordship considered that this was a proper case to be prosecuted, and the interests of the company should be protected from frauds, some leniency would be shown to him.

The prisoner having formally pleaded "Guilty,"

The ASSISTANT-JUDGE, in passing sentence, said: If there were reasons to believe that frauds such as these, of which you have now confessed yourself guilty, are of common or frequent occurrence, I should pass upon you a heavier sentence than I am about to do, for yours is a very bad case, as you have been cheating and robbing the gas company day by day for several years past. These larcenous acts are of a very artful and knavish character; they may remain undiscovered for years, and the proof of them may not always be as complete and easy as it has been in your case, and therefore, when they are brought home to the actual offender, they call for severe punishment. The sentence upon you is that you be imprisoned and kept to hard labour for 15 months.

MARLBOROUGH STREET POLICE COURT.—THURSDAY, AUG. 24.

(*Before Mr.* KNOX.)

GAS DEFAULTERS AND THEIR GRIEVANCES.

A number of tradesmen were summoned for allowing their gas bills to fall in arrear to The Gaslight and Coke Company, Horseferry Road. One of the parties summoned for £1 13s., Mr. *Blake*, printer, of Broad Street, Golden Square, wished to know whether the collectors were justified in coming into his premises and demanding payment of arrears in a rude and insulting way, no matter who was present, or what the business in which he might be engaged. He had to complain generally of the want of courtesy on the part of the servants of the company, which he partly attributed to the fact of having reported one—a son of one of the directors.

Mr. FRIEND, who appeared for the company, said he could not allow this statement to go forth without reply. Mr. Blake was a troublesome person in his way, and being in the habit of allowing his gas bill to fall into arrear in the summer, it was necessary to summon him, this being the fourth time in which it was requisite to take out process. The company's servants were never deficient in proper civility, but they did not always get it in return.

Mr. *Blake* requested to know if the Act of Parliament entitled the company to act in the arbitrary way they did, there being no sound reason for putting him to the expense of coming to that court.

Mr. *Herne*, appraiser and broker, Porter Street, was summoned for 6s. by the company. He also complained of the conduct of the company in summoning him, he having been 28 years in business, and having always paid his gas-rates. He had deposited a sovereign with the company on opening an account with them.

Mr. FRIEND said Mr. Herne had changed his address, and had not attended to the previous summonses. The company's collectors were obliged to follow out the instructions received from the board—they would be fined otherwise—and they only acted on instructions in taking out summonses against persons in arrear.

The orders for payment were then made.

WANDSWORTH POLICE COURT.—WEDNESDAY, AUG. 23.

(*Before Mr.* PAGET.)

A POLLUTED WELL.

William Clifford, a cowkeeper, of Barnes Common, appeared to answer an adjourned summons with reference to the supply, to three houses in West Fields of well water that was so polluted as to be injurious to health.

Mr. ALFRED J. WOOD, clerk to the Rural Sanitary Authority of Richmond, attended in support of the summons, and in reply to the magistrate, said the well was not closed.

Mr. PAGET remarked that the summons was adjourned for a fortnight, to enable the defendant to close the well.

The *Defendant* said he was not aware that he was required to close it. He had brought one of the tenants who used the water.

Mr. PAGET said he heard all the evidence, and it was perfectly clear that if the well was not closed it would create a pestilence.

The *Tenant* said he had found great relief from the use of the water. He drank it fasting, and he assured the magistrate he had derived great benefit from it.

Mr. PAGET thought he did not look so well as the witness who had not tasted it, and added that the tenant had, by what he said, shown a strong reason for the closing of the well.

The *Tenant* produced two tumblers, and said one had been filled with main water. He held it up, and stated after standing for ten days there was slime in it. He held up the second tumbler, which had been filled up with pump water, to show that it was free from slime. He added that the main water was full of insects, and he had to boil it before he could drink it.

Mr. PAGET said he heard the evidence last time, and he could not alter his decision.

The *Tenant* asked the magistrate to allow the water to be used for washing purposes.

Mr. PAGET refused, as he believed the tenant could not resist the temptation to drink it, and so made an order for the well to be permanently closed.

ROCHESTER COUNTY MAGISTRATES COURT.—FRIDAY, AUG. 25.

BREAKING STREET-LAMPS.

John Edward Blaney, Frederick Putteney, Reginald Brougham, and *Egerton Cogwell*, all of whom were respectably dressed, and described as students, were charged on summonses, with wilfully breaking the public lamps in Northfleet, belonging to the local board.

Mr. HATTEN, clerk to the board, prosecuted; and Mr. WRIGHT appeared for the defendants.

The defendants were all seen in a waggonette, at about twelve o'clock at night, when, as they passed the various lamps, they drew up and broke them with stones, which they had with them, as they did not leave the waggonette.

Mr. WRIGHT, on the part of the defendants, expressed their sorrow at their disgraceful conduct. On the following morning the defendants were fully alive to the humiliating position in which they had placed themselves, and they at once wrote to the local board expressing regret for their conduct, and offering to make good the damage done. Under these circumstances they hoped the magistrates would be as lenient as possible.

The MAGISTRATES, having consulted in private, said they were sorry to see persons in the defendants position disgracing themselves in the manner they had done. The magistrates felt that they would be wanting in their duty if they did not inflict the severest penalty, and they would therefore fine each of the defendants £5, together with the damage and costs.

The money was paid.

A summons had been issued against *Arthur Ateaga*, another of the party, but he departed for Italy before the summons could be served.

Miscellaneous News.

CANTERBURY GAS AND WATER COMPANY.

The Half-Yearly Meeting of this Company was held on Friday, the 25th ult. —Mr. G. FURLEY in the chair.

The SECRETARY (Mr. J. Burch) read the notice convening the meeting, and the following report was presented:—

The directors are much gratified in being able to point to the continued prosperity of the company.

The best efforts of the directors have been used to supply the inhabitants of the district with gas and water at reasonable rates on the one hand, whilst ensuring to the shareholders the moderate maximum dividend allowed by the Legislature on the other.

It will shortly be necessary that some further and important portions of the gas plant should be renewed, and to meet the requisite outlay a portion of the surplus profits is being accumulated and invested.

The balance standing to the credit of the profit and loss account is £3920 9s. 7d., and the directors have again the pleasure of recommending that a dividend at the rate of 8 per cent. per annum, free from income-tax, be declared.

The CHAIRMAN moved the adoption of the report. He said that he believed it would be found satisfactory not only to the shareholders present, but to those absent. He would take it that those who were not present considered it satisfactory, as there were no dissenting voices against the conduct of the directors during the last half year. The company had achieved an amount of success during that time, and the same dividend could be allowed as paid for the last two or three half years. Referring to the statement in the report that it would shortly be necessary that some further and important portions of the gas plant should be renewed, he remarked that a fund had been reserved for the purpose of the renewal of the plant, and it was now necessary that something should be done to the retort-house, the walls of which were cracking and bulging, and the roof was in a bad state. Another important question they would have to consider would be whether they should repair the present house or erect a new one on the land they purchased some time ago. They were not going to consider it then, but they must not let it pass their eyes. There would be a saving if they built a new house on the land rather than if they had it where it was at present, as it would be nearer. He then referred to other works that it would be necessary to carry out, which he hoped would be satisfactory to the shareholders, as they would be the means of increasing the profit. The old castle, which they used as a store, they had expended £200 or £300 upon, in having a new roof put to it, so that they could store a large quantity of coals away, and now they had between 1500 and 1700 tons of coals there, which he was pleased to say were all paid for, so that they would not, about Christmas time, be told that they were short of coal. The shareholders had, no doubt, seen in the papers that the company's premises were to be re-valued. If the guardians did not think the rating of their property was right, they were justified in having it re-valued; but he thought that as there were other public bodies in Canterbury, their property should be similarly treated. They had placed themselves in the hands of some gentlemen in London, and had told them to give the other valuer engaged all the information about the rateable value of the company's property that they thought right. He hoped they would be able to come to a decision which would be fair to both bodies, so as to avoid going to law to contest the matter.

Mr. MARTIN seconded the motion, which was agreed to, as was also one for the payment of the dividend recommended in the report.

Mr. MAYNARD proposed a vote of thanks to the chairman and directors for their services during the last half year, which was carried, and having been acknowledged, the meeting broke up.

VITERBO GAS COMPANY, LIMITED.—An extraordinary general meeting of this company was held at their offices, No. 2, Gresham Buildings, London, on Tuesday, the 8th ult., when the following resolutions were duly passed:—"That it has been proved to the satisfaction of the company that the company cannot, by reason of its liabilities, continue its business, and that it is advisable to wind up the same." "That the company be wound up voluntarily." "That Mr. William Slingsby Ogle be and is hereby appointed liquidator."

SCARBOROUGH GAS COMPANY.

The Ordinary Annual Meeting of the Proprietors was held on Saturday, the 19th ult.—Mr. JOHN LECKENBY in the chair.

The SECRETARY read the circular convening the meeting, and the following report was presented:—

The directors of the Scarborough Gas Company trust the balance-sheet subjoined will verify the hopes that were expressed in their report of the previous year.

While the receipts are considerably in excess, the cost of manufacture has been less; and after paying or providing for every liability on revenue account, and writing off all bad debts, there remains an available balance of £2705 3s. 8½d., which will admit of the usual half-yearly dividend to each class of proprietors, amounting to £2567 19s. 11d., and leave £137 3s. 9½d. to carry forward to the contingent-fund, which will then amount to £3854 17s. 2½d.

The directors have renewed their contract for the supply of coal for twelve months on such terms as will enable them still further to reduce the price of gas, particulars of which will be duly announced to their customers.

The new works are nearly completed and are in satisfactory working order. Shortcomings on the part of certain contractors produced delays and inconvenience, but these were probably not more than, in an undertaking of this magnitude, might have been expected. The company were some time ago accused of creating an offensive smell in Seamer Valley, and this accusation has, to the surprise of the directors, been recently renewed. To avoid the possibility of any unpleasant vapours from the manufacture of ammoniacal products, the directors, at a great sacrifice, purchased Mr. Crosby's ammoniacal works and closed them. They entirely deny that any injurious smell proceeds from their works.

The directors express their unabated confidence in their manager, Mr. Moon, and their general satisfaction with the manner in which their various officers discharge their duties.

Revenue Account.

Dr.					*Cr.*			
Gas manufacture, viz.:—					Gas and meter rents, public lighting, and other contracts	£20,753	12	8
Coals	£10,013	9	0		Residuals, viz.:—			
Lime, tan, oxide, less refuse lime	192	7	0		Coke	2,809	3	7½
Water	50	9	9		Tar	970	0	6
Wages	2,413	2	2		Ammoniacal liquor	242	5	0
Cartage	42	15	8		Transfer fees	2	12	6
Sundries—oils, paints, brushes, shovels, &c.,	189	16	11½		Rents, tenements, less repairs	46	1	2
Lamp department, viz.:—					Debts recovered	2	17	7
Repairs, renewals of lamps	217	12	6					
Lamplighters wages	382	19	6					
Repairs, &c., viz.:—								
Repairs, renewals, and inspection of meters	354	13	1					
General	193	2	4					
Renewal of retorts	121	2	8					
Mains and services	85	8	3					
Charges, &c., viz.:—								
Rates and taxes	643	12	11					
Salaries	732	0	0					
Printing and stationery	63	2	9					
Incidentals	80	6	1½					
Law charges	8	0	0					
Income-tax	43	2	6					
Insurance	43	18	6					
Gratuity to manager	100	0	0					
Directors remuneration	209	0	0					
Auditing company's accounts, 1874–1875	15	0	0					
Interest, &c., viz.:—								
On preference stock	1,367	3	0					
On mortgages, loans, &c.	1,163	17	6					
For bank charges	351	2	3					
Overcharges, allowances, &c.	10	14	6					
Discounts to large consumers	240	14	9					
Bad debts, written off rentals	35	15	9					
Ad interim dividend, Dec. 31, 1875	2,567	19	11					
Balance	2,705	3	8¼					
	£24,826	13	0¼			£24,826	13	0¼

The CHAIRMAN, in moving the adoption of the report, said he would just make one or two comments as they presented themselves. With regard to the purchase, for £850, of the ammoniacal liquor works of Mr. Crosby, he believed the works could have been carried on without any nuisance whatever, but fearing there might be some cause of complaint, the company thought it more prudent to prevent the possibility of any smell, and therefore purchased the works in order to close them. He was glad to say, since the company commenced at the new works, they had not had any complaint as to a supply of gas; some persons had complained that they were charged for more gas than they burnt, but the company in all cases had been able to satisfy them they were not overcharged. As to their future prospects, the manager assured them, from the increase in the consumption of gas, that he did not doubt they could maintain their dividends intact. He (the chairman) wanted to offer a few remarks upon the very vexed subject of the complaints of late about the gas-works being a nuisance. He believed himself that if all the mischief arising from badly placed ventilating shafts, defective private drainage in houses, the effluvia arising from night-soil carted between 10 p.m. and 5 o'clock in the morning, and from fish and other refuse of all sorts, which were always removed at night—if all this were eliminated, a very small residuum would remain to charge against the company. He had made some inquiry as to the nature of these smells complained of. One said it had a strong smell of manure; another said it was very like stinking fish. These two smells could not possibly emanate from the gas-works. Then as to the time when the smell occurred, it had been impossible to find any uniformity of testimony. One said "eleven o'clock at night;" another, "five o'clock in the morning"—a very unlikely hour for any effluvia from the works. He had heard another theory—that of the borough surveyor, and therefore entitled to respect. It was that they evolved a gas which was of so heavy a nature that it floated about in masses, and would not commingle with the atmosphere; thus it might get into one person's house and not into another's. This was to explain the statement that on the South Cliff one person sometimes smelt it strongly, and his next-door neighbour did not smell it at all. He thought it very scientific when he first heard it, but he consulted with Mr. Dale, a gentleman who understood these matters, and he might say that he literally scattered it to the winds. He said gas did not move about intact in that sort of way. He (the chairman) confessed to a little feeling that the company had been somewhat persecuted, and he could not but regard, as unnecessary, the degree of acrimony which seemed to pervade the speeches of the Town Council upon the subject. They were anxious to work harmoniously with the town; it was to their interest to do so. They knew gas-works were constructed so as not to be a nuisance in other towns, and they saw no reason why they should not be carried on equally so in Scarborough, and he believed they would be. With regard to the hints made about new works, he could say that if new works were erected, they would not remove this company from Seamer Lane, and he hoped and believed that the manufacture of gas there would go on without being prejudicial to the health or comfort of the inhabitants. With regard to the health of Scarborough, he need not do more than refer to the statistics of the death-rate which were given side by side in the papers with the dreadful complaints made of the nuisance said to be so dangerous to health, and if he referred to the number of visitors in Scarborough, it must be a matter of congratulation to them that so far these evil reports had not done much injury. In conclusion, he spoke of the reduction in the price of gas, from 4s. 6d. to 4s. 2d., from the 1st of January, which might not seem much, but they wished to keep their accounts in decimals, and he hoped that the future reduction would be at the rate of 5d., and then another similar reduction, provided the price of coal should further decrease.

Mr. BECKETT seconded the motion.

Mr. DALE said he had paid considerable attention to the subject, and must say that it appeared to him that the smell arose from the gas-works. It was always of the character which those who were familiar with the smell of bad gas were able to recognize, and it was smelt when the wind was in a certain quarter—when it came from the direction of the gas-works. There was no question, he thought, that gas could be manufactured tolerably free from smell, if the plant was in good working order and free from defect, if skilled workmen were employed, and care taken. He thought the time had arrived when it was important that this question should be settled. If the smell did come from the gas-works, means ought to be taken to prevent its occurrence in the future. If it did not come from the gas-works, it ought to be made out very clearly whence it did come.

Dr. JACKSON said he was very sorry Mr. Dale had taken the line he had done, for he was not supported by facts. The directors of the gas company were most anxious to suppress any nuisance that might in any way arise from their works, and that was proved by their having purchased Mr. Crosby's works at a cost of £850. He denied *in toto* the allegation that the effluvia could be traced to the gas-works, and was glad the corporation had at last taken a sensible course, and resolved to get an inspector from the Local Government Board to investigate the matter, and in their action they would have the co-operation of the directors of the gas company.

The report was then adopted.

On the motion of the CHAIRMAN, the three retiring directors—Messrs. G. F. Brown, W. Rowntree, and R. Cross—were re-elected, and Mr. Hawson Herbert was re-elected one of the auditors; and it was decided to declare a dividend of 10 per cent. on the old stock, 7½ on the new consolidated stock, and 7 on the preference converted stock.

A motion was then submitted to discontinue paying the directors fees of £200, but it was lost, only three shareholders being in favour of it.

A vote of thanks having been passed to the chairman and directors for their continued attention to the affairs of the company,

The CHAIRMAN, in responding, said he always gave his fees away, and the Scarborough charities would suffer if the £200 were withdrawn. As the company were paying the full dividend allowed by law, he thought no shareholder should complain of the remuneration, which came out of the pockets of the public, and not out of his own.

WOLVERHAMPTON GAS COMPANY.

The Half-Yearly Meeting of this Company was held on Tuesday last—Mr. J. UNDERHILL in the chair.

The SECRETARY (Mr. A. Jones) read the directors report as follows:—

Your directors beg to lay before you their forty-ninth half-yearly balance-sheet and statement of accounts, duly certified by your auditor, showing the revenue for the half year ending June 30, 1876, to be £22,895 17s. 10d., and the expenditure £19,322 18s. 4d., leaving a balance of £3572 19s. 6d., which, added to the balance of last account, amounts to £4345 10s. 6d.

Your directors recommend the usual dividend of 5 per cent. to be paid, and propose to take the balance required for that purpose from the reserve-fund.

Since the last meeting your directors have to regret the loss by death of Mr. Thomas Wood. The vacancy thus created has been filled by the appointment of Mr. G. L. Underhill.

Your directors have also to regret the death of Mr. B. Savage, but as it has occurred so recently, they suggest that the vacancy had better remain open for a short time.

The usual repairs, alterations, and improvements of the works and plant, together with the renewal and enlargement of a gasholder, and a new retort-house, have been in progress during the last six months, and will very shortly be completed.

In conclusion, your directors assure you that they will continue to devote their best energies to promote the interests of the company

The CHAIRMAN, in moving the adoption of the report and balance-sheet, called attention to the fact that the latter had showed that they had not made sufficient profit during the year to cover the dividend usually paid by the company, and said that this arose from two or three causes. In the first place, the reduction in the price of coal had not, as yet, taken effect to any appreciable extent. Throughout the whole of the past year their coal had been much the same price as in the year before, because, as they were all aware, the company were obliged to make contracts for six or twelve months, and if coal happened to be reduced during the time, they were not in a position to take full advantage of the reduction. Another cause was that coke had dropped, rather in anticipation of the fall in the price of coal, and they were compelled to submit at once to any reduction in coke, notwithstanding their disadvantage as to the coal. There had also been a difficulty in selling the coke, in consequence of the depression in the iron trade. Further, there had been an issue of new preference shares, on which £10,000 were called at the beginning of the year, necessitating the payment of nearly £300 as dividend. These were the principal reasons why the directors were unable to pay the dividend without taking from the reserve-fund. When, however, they came to consider that the new contracts made for the supply of coal showed a reduction of price for the year now commencing, and that most likely the price of coke would suffer no fall, but would, in all probability, be better than in the past year, and also that the price of other products would improve, they could understand that there was no doubt in the mind of the directors that they would be able to show a better state of things next half year. Of course, the shareholders knew that the matter might have been remedied at once if they had raised the price of gas; but the directors thought they were acting in the interests of the shareholders, and also in the interests of the public, by keeping the price as it had been for some years. He thought that by doing so they had given every satisfaction to the general public, and thereby promoted the interests of the general shareholders. He need not say that the quality of the gas had been kept up to the standard of former years, and, if anything, had exceeded it. Some complaints had been made during the year of an occasional insufficient supply, but there had never been a real substantiated complaint as to its quality. The directors were taking steps, by the erection of a much larger holder than they previously had in one part of their works, and also by laying down new mains of larger diameter in various places, to obviate this state of things. They were also erecting a new retort-house to enable them to manufacture a far larger supply than hitherto. These works were all in progress, and the manager believed they would be completed for use by the winter. A large expenditure was, of course, entailed by these alterations; but they must remember that in a place like Wolverhampton, which was constantly increasing in size, the company must, from time to time, expend capital in enlargements in order to meet the demands of an increase of customers. He briefly referred to the deaths of the two directors mentioned in the report, and concluded by assuring the meeting that the board would never fail to remember that what was the interest of the public was also the interest of the shareholders.

In answer to Mr. WARNER, the CHAIRMAN said that the amount proposed to be taken from the reserve-fund was £860.

Mr. LOVERIDGE seconded the motion, which was agreed to.

Motions for the declaration of the dividends on the ordinary and preference capital were also agreed to, and the thanks of this meeting were voted to the chairman and board of directors.

Mr. ANNAN (the engineer), in responding to a vote of confidence in the officers of the company, expressed his opinion that, unless coal should increase in price, the directors had resorted to the reserve-fund for the last time.

READING GAS COMPANY.

The Half-Yearly Meeting of the Shareholders was held on Monday, the 28th ult., when the following report of the directors was presented:—

The directors have the pleasure to present to the shareholders the statements of account and balance-sheet for the half year ended the 30th of June last, and in doing so to recommend that full dividends be paid on the 1st of September next on all the stock, and shares of the company, in accordance with the scheme set out in dividend account. Your directors have also the pleasure to recommend that a sum of £500 be now invested on account of reserve-fund

The extension of works (power to carry out which was given at the last half-yearly meeting of the company) is proceeding under the management of Mr. Baker, the company's engineer. Satisfactory contracts for supplying purifiers and station-meter, and sheds to contain the same, have been obtained, and the various works are approaching completion. Your directors have not yet had occasion to exercise the powers given to raise the necessary capital for these works, as under the contracts made the contractors have not yet become entitled to a settlement of their accounts. The money will, however, be required in the ensuing autumn, and due notice will be given when the shares are to be sold.

Your directors are gratified to find that the loss of gas by waste and condensation is less this half year than has ever been previously known. Of the gas made all has been brought into charge but 7·375 per cent. This is an exceedingly small per centage of loss, and in the face of the damage to mains caused by the carrying out of the sewerage works and the subsidence of the ground consequent thereon, speaks well for the supervision of Mr. Baker.

Your directors have concluded an arrangements with the sanitary authority for the supply of the public lamps for a period of three years from the 30th of June last.

The ordinary business of the company has been conducted to the satisfaction of your directors.

Dr. *Profit and Loss Account, June 30, 1876.* *Cr.*

Coals consumed			£5,670	12	5	£10,317	11 2
Purifying materials			93	10	2	1,878	6 4
Meters			122	1	6	1,123	11 2
Fittings			87	0	3	12	18 6
Materials			769	19	7		
Contingency-fund			365	0	0		
Wages			1,883	1	10		
Salaries, &c.			729	2	6		
Tradesmen's bills			122	3	10		
Rates, taxes, &c.			494	6	2		
Interest			242	11	9		
Bad debts and allowances			41	4	1		
Miscellaneous			113	8	6		
Balance			2,663	19	7		
			£13,398	2	2	£13,398	2 2

Balance-Sheet.

Share capital paid up			£62,000	0	0	Cost of plant, &c.	£76,041 15 2
Mortgage debt			11,000	0	0	Amount due for light	4,550 8 0
Premiums on shares			4,315	5	0	Coke	659 10 9
Debts due to sundries, viz.:						Tar and ammoniacal liquor	538 0 1
Capital			156	10	7	Fittings	102 1 0
Coal			135	16	8	Materials	12 10 0
Coke			7	5	10	Stock on hand—	
Purifying materials			9	0	0	Tar and ammoniacal liquor	118 9 8
Meters			23	10	0	Purifying materials	100 0 0
Fittings			14	13	7	Coals	571 11 4
Wages			3	10	0	Coke	16 0 0
Materials			587	7	3	Meters	101 9 3
Tradesmen's bills			47	14	11	Fittings	119 0 0
Rates, taxes, &c.			476	14	4	Materials	711 0 0
Salaries, &c.			102	18	0	Office furniture	40 0 0
Contingency			84	10	10	Balance, contingency-fund	29 6 7
Miscellaneous			23	16	7	Ditto in banker's hands	5,660 19 10
Unclaimed dividends			109	16	5	Petty cash in hand	65 0 0
Reserve-fund, £3000, and dividends accrued thereon, invested in £3590 18s. 9d., New Three per Cent. Stock.							
Dividends received to be invested			213	13	4		
Balance brought from last account—dividend account			7,460	19	2		
Profit and loss account			2,663	19	7		
			£89,437	1	8		£89,437 1 8

BRIGHTON GASLIGHT AND COKE COMPANY.

The Ordinary General Meeting of Proprietors was held at the Offices, St. Swithin's Lane, London, on Thursday, Aug. 31, when the following report and accounts were presented:—

The consumption of gas during the past six months, compared with the previous corresponding period, has largely increased; but the directors regret to have again to report that the prices realized for coke, notwithstanding the long protracted winter, have been very unsatisfactory,

The bad weather which prevailed for several months has been very unfavourable to the ordinary operations of the company, and considerably delayed works in hand. Latterly, however, there has been greater freedom from this kind of interruption.

An extension along the Marine Parade, from Bedford Street to the Steyne, of the 20-inch main substituted for the 10-inch main, is completed, affording an important additional power of gas pressure at the lowest level of the town.

The directors recommend the declaration of a dividend on the paid-up capital of the company of 4½ per cent. for the half year ending the 24th of June last, less income-tax; the same to be payable on and after the 11th of September next. This dividend is at the same rate as for the corresponding period last year, but has to be also paid on a heavy call on the new shares subsequently made.

The trustees of the turnpike road which passes the company's land, assisted by contributions from the Corporation of Brighton, from the Sewer's Board, and from the principal owners of adjoining property (including this company), have recently erected a groin in front of the cliff at Black Rock. This, in combination with the sea-wall built several years since, will, it is expected, prevent further encroachment of the sea at that point.

Dr. *Profit and Loss Account, for the Half Year ending June 24, 1876.* *Cr.*

Coals			£13,481	3	11	Gas and meter rental	£19,353 14 7
Materials for purification			396	4	0	Coke, &c.	5,559 7 5
Wages			2,345	9	3	Old stores, &c.	404 5 6
Rent, rates, and taxes			281	0	6		
Salaries, collectors commission, directors, and auditors			1,640	3	3		
General charges			221	13	11		
Wear and tear			2,445	18	8		
Bad and doubtful debts and allowances			75	0	0		
Balance			4,430	14	0		
			£25,317	7	6		£25,317 7 6

Balance-Sheet.

Capital			£98,800	0	0	Expended on works	£87,089 11 3
Amount received on account of call due 26th inst.			1,866	0	0	Works in progress	5,698 17 4
Contingency-fund			5,775	12	6	Meters	2,087 13 7
Coal insurance account			1,749	8	7	Coal, coke, &c., in stock	6,664 8 7
Dividends unpaid			1,668	6	3	Mains, service-pipes, and general stores in stock	3,706 6 6
Depreciation account			1,977	3	11	Sundry debtors for gas	6,808 12 9
Tradesmen's accounts, &c., owing			2,729	17	9	,, ,, coke, &c.	1,743 8 0
Balance from last half year			214	16	5	Cash at bankers and in hand	5,413 1 5
Do., this half year, as above			4,430	14	0		
			£119,211	19	5		£119,211 19 5

SOUTH SHIELDS GAS COMPANY.

The Half-Yearly General Meeting was held on Friday, the 25th ult.—Mr. R. Wallis in the chair.

The Secretary (Mr. J. H. Penney) read the following report:—

In presenting the report, together with the balance-sheet and accounts, for the half year ending June 30, 1876, your directors have to express their congratulations at the continued success of this company.

They are enabled to recommend an interim dividend at the rate of 4½ per cent. on the A stock, and 3¼ per cent. on the B stock and subscribed new capital, which will leave a very satisfactory balance to be carried over to next half year.

The directors, therefore, have much pleasure in announcing their determination to make a further reduction of 3d. per 1000 in the price of gas, which will make the price 3s. 6d. per 1000, with the usual discounts. This reduction to take effect from July 1 last.

The illuminating power of the gas had been kept above the standard required by this company's Act of Parliament.

Dr. *Profit and Loss Account.* *Cr.*

Balance from Dec., 1875			£4,485	13	11	Dividend on A stock	£1,800 0 0
						Dividend on B stock	604 11 4
						Balance carried down	2,081 2 7
			£4,485	13	11		£4,485 13 11
Balance down			£2,081	2	7	Stock of coals, coke, tar, &c., from 1875	£1,400 18 3
Half year's gas and meter-rental (net)			11,335	19	4	Coals and cartage	3,469 13 2
Sale of coke			1,468	1	2	Wages and superintendence	2,901 6 1
Sale of tar			789	2	1	Salaries	210 11 5
Profit on ammonia			264	1	2	Collectors commissions	211 0 0
Corporation, upholding public lamps	£411 17 6					Rents	36 16 9
Less credited last half.	182 7 7					Rates	285 15 6
			229	9	11	Directors, auditors, and scrutineers fees	122 2 0
Service charges, fixing meters, &c.			54	17	11	Lime	131 10 3
Rents from property at Jarrow			1	13	4	Water	57 7 9
Stock of coals, coke, tar, iron, and sundries			1,058	18	9	Retorts, bricks, &c.	257 0 10
Transfer fees			9	15	0	Service-pipes, gas-cocks, iron, steel, and tin goods	380 6 4
Old materials sold			26	8	0	Castings	10 12 0
Discounts allowed off accounts			9	6	1	Cartage	120 4 3
						Paving	28 2 0
						Stationery, printing, &c.	69 1 10
						Incidentals and miscellaneous	391 10 7
						Paints, oils, &c.	42 1 0
						Wear and tear—maintaining and relaying mains	782 19 8
						Interest on loans	377 1 3
						New meters	1,141 19 9
						Repaired meters	418 12 11
							£12,846 13 7
			£17,319	15	4	Balance to profit	4,473 1 9
Balance down			£4,473	1	9		£17,319 15 4

Balance-Sheet.

Proprietors capital—						Plant, works, &c., as per last statement	£58,883 19 1
A stock			£40,000	0	0	Extensions and relay of mains, during half year	77 18 9
B stock			20,000	0	0	Jarrow works—new holder	3,509 0 0
New			3,870	0	0	Test gasholder, &c.	64 12 0
Loan capital, mortgages, and bonds			16,600	0	0	Office and board room furnishings	103 8 4
Revenue account, balance of profit			4,473	1	9		£62,638 18 2
Sundry accounts owing for coals, lime, iron goods, &c.			1,098	8	2	Less wear and tear,—maintaining and relaying mains, &c.	782 19 8
Deposits for gas			834	6	6		£61,855 18 6
Reserve-fund			5,998	3	3	New works in progress at Jarrow	15,364 1 4
Dividend on £5811 15s. 3d., invested in 3 per cent. Consols			92	18	0	Horses and carts, less profit	560 8 9
						Stock of horses food, acid, coals, coke, tar, &c.	1,067 19 0
						Consumers accounts, inclusive of quarter due this day	5,406 6 10
						Sundry accounts owing for coke, tar, &c.	1,572 0 4
						Reserve-fund invested in 3 per cent. Consols	5,811 15 3
						Balance with bankers	1,272 11 9
						Cash in hand	55 15 5
			£92,966	17	2		£92,966 17 2

The Chairman, in moving the adoption of the report, said he had no doubt it would be satisfactory to the shareholders. From the balance-sheet, it would be seen that there was a large profit left wherewith to pay their dividends, and what was over they purposed to be carried to the next half year. Considering the large amount of unproductive capital they had lying at Jarrow, it must be satisfactory to know that the work of the company during the past half year had been most successful. With regard to the large surplus the company had at their disposal, the directors thought they could not do better than recommend a reduction of price to the consumers of 3d. per 1000 cubic feet, with the usual discounts, and when they considered that the discounts of the company were considerably higher than most of the companies in the district, and that the time was longer for the payment of the money, he thought the public were very fairly dealt with. As the shareholders were aware, the company had been engaged for the last two or three years in overhauling pipes and mains throughout the whole of the district, and he was glad to state that the result, so far as had already been ascertained, would be most satisfactory. The waste of gas, from various causes, had been reduced from 14 per cent. last half year to 6 per cent. during the past three months, which was a saving of 5 million cubic feet of gas, representing in money value £800. He then referred to the fact that the directors had made some satisfactory contracts for coals, from which they obtained a large amount of gas, and stated that the company were obtaining a satisfactory sale for their residual products, so that altogether there was every prospect of the continued success of the company.

Mr. Chapman seconded the motion, which was carried.

The dividends mentioned in the report having been declared,

Mr. Dale moved a vote of thanks to the directors for the very able manner in which they had discharged their duties during the past half year. He said that at the present time, when trade was in such a depressed condition, it was something remarkable that they, as a company, should be an exception, in the success which they were attaining in making gas, and also that they should be able to pay such dividends, and fulfil an obligation to the consumers by reducing the price of gas.

Mr. Duncan seconded the motion, and it was agreed to.

The Chairman returned thanks for the compliment paid to himself and brother directors, who, he said, endeavoured on all occasions to do everything for the benefit of the shareholders. He referred to the depression of trade at Jarrow, but remarked that it was exceedingly singular that although Shields had increased in the number of its consumers, yet Jarrow had increased more so. He thought the directors would be in a position in the coming winter to make as much gas as would be needed at Jarrow.

The proceedings terminated with a vote of thanks to the chairman.

RETORT SETTINGS, No. 3.

FIG. 1.

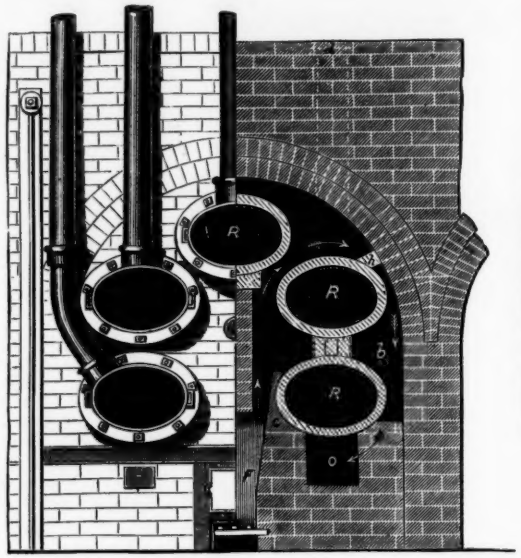


FIG. 2.

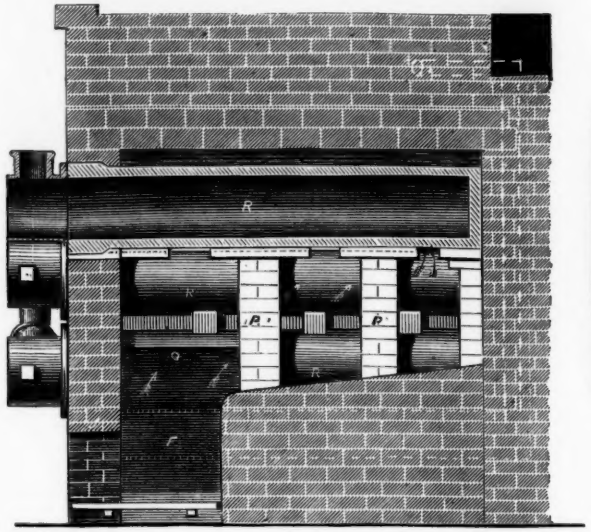
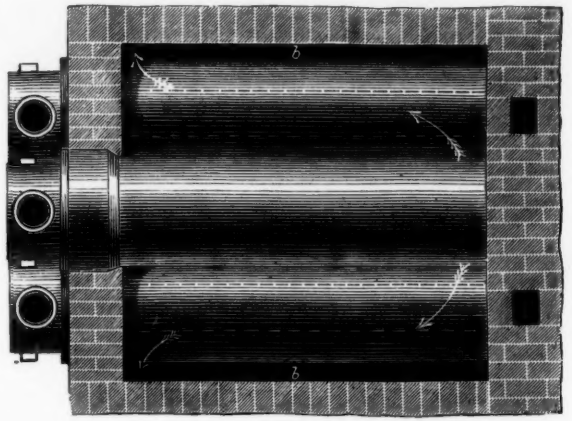


FIG. 3.



SCALE OF FEET

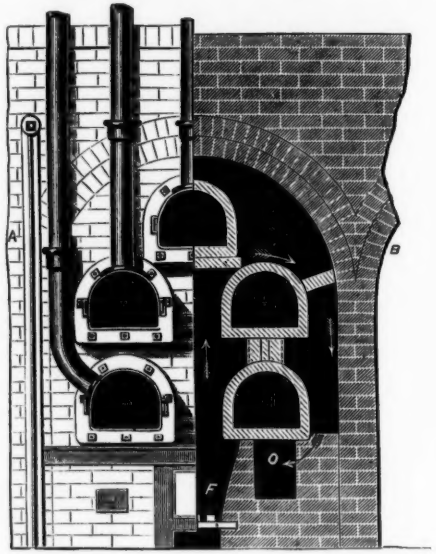


FIG. 4.

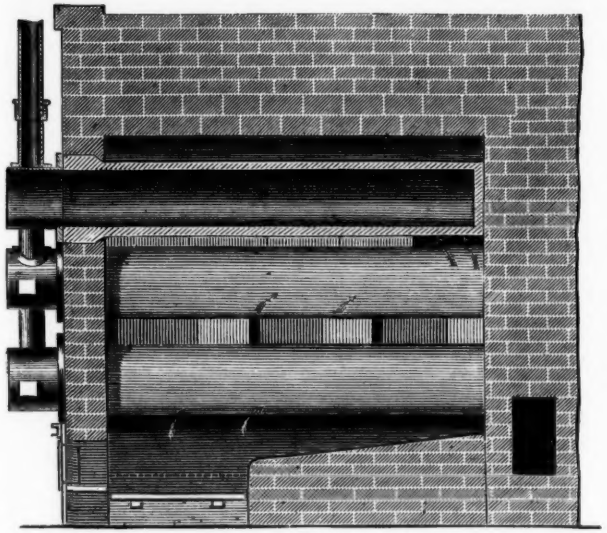


FIG. 5.

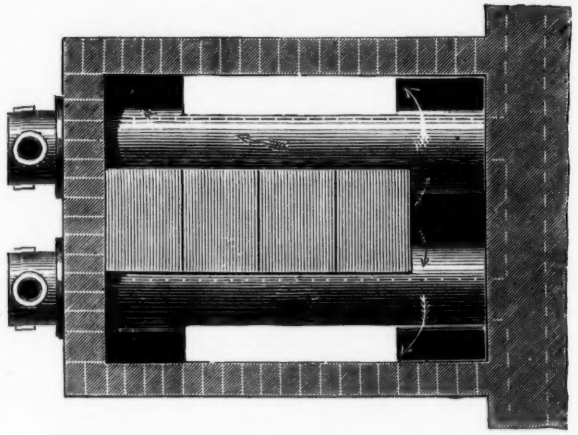


FIG. 6.

SETTINGS OF FIVE RETORTS.

METROPOLIS WATER SUPPLY.

The following are the returns of the Society of Medical Officers of Health, on the composition and quality of the metropolitan waters in August, 1876:—

Names of Water Companies.	Total Solid Matter per Gallon.	Oxygen required by Organic Matter, &c.	Nitrogen — As Nitrates, &c.	Ammonia. Saline.	Ammonia. Organic.	Hardness (Clarke's Scale). Before Boiling.	Hardness (Clarke's Scale). After Boiling.
Thames Water Companies.	Grs.	Grs.	Grs.	Grs.	Grs.	Degs.	Degs.
Grand Junction	19·80	0·046	0·110	0·000	0·007	13·2	2·0
West Middlesex	17·50	0·050	0·090	0·000	0·008	13·2	2·4
Southwark and Vauxhall	17·60	0·039	0·108	0·001	0·006	13·2	2·0
Chelsea	18·70	0·043	0·102	0·000	0·008	13·2	2·0
Lambeth	18·90	0·044	0·102	0·000	0·007	13·2	2·4
Other Companies.							
Kent	27·70	0·007	0·180	0·000	0·002	20·0	4·2
New River	17·70	0·028	0·102	0·000	0·004	13·2	2·4
East London	19·00	0·039	0·090	0·000	0·004	13·2	2·0

Note.—The amount of oxygen required to oxidize the organic matter, nitrites, &c., is determined by a standard solution of permanganate of potash acting for three hours; and in the case of the metropolitan waters the quantity of organic matter is about eight times the amount of oxygen required by it.

The water was found to be clear and nearly colourless in all cases but the following, when it was slightly turbid—namely, West Middlesex.

C. Meymott Tidy, M.B.

DERBY WATER-WORKS COMPANY.

The Ordinary General Meeting of this Company was held on Wednesday last—Mr. Gascoyne in the chair.

The following report of the directors was taken as read:—

The directors beg to submit to the shareholders the accompanying statement of accounts for the half year ending June 30, 1876. The gross receipts from the revenue account amount to £5813 0s. 1d., being £90 7s. 2d. more than in the corresponding half year of 1875. The revenue expenditure amounts to £3113 12s. 0¼d., being £494 5s. 2¼d. more than that of the corresponding half year. The net profit realized is £2699 8s. 0¼d., which, together with the surplus brought forward from the last account, leaves £3962 9s. 11d. now available for dividend. The directors recommend the payment of the usual dividends of 10 and 7 per cent. respectively; and as these will amount to £4203 12s. 2d., a deficit of £241 2s. 3d. will exist; this deficiency will be supplied from the contingent and suspense funds, which funds now amount together to £5029 6s. 3d. The cause of the deficiency is that £30,453 3s. 3d. of additional capital having been expended in the last twelve months, the dividends now due exceed those paid in the corresponding half year by £1045 1s. 2d., and at the same time the charges for rates, taxes, bank interest, and additional easements, over which the board possess little control, are larger by £220 2s. 2d.

As the dividends and interest will further increase for at least another half year, the directors have determined to borrow the sum of £20,000, which, it is believed, will entirely complete both the new works and the ordinary extensions of mains, and it is probable that no further calls upon the shares will for the present be required. The last portion of the works connected with both systems—namely, the additional receiving-tank—has been commenced, and is being vigorously pushed forward by the contractor, and it is expected that in the course of another three months the whole will have been finally completed; and the directors believe that when this shall have been accomplished, few towns in the kingdom will possess a water supply in all respects so good, complete, and efficient as Derby. Messrs. Hawksley, having recently made a minute and careful examination of the whole of the works and property of the company, have expressed themselves highly pleased with the results of the operations so far, and with the spirited manner in which their own efforts and wishes, as the engineers of the company, have, throughout the conduct of the works, been appreciated and sustained.

The Chairman, in moving that the report of the directors be received, approved, and adopted, said this was the fifteenth occasion on which he had moved a similar resolution, and it was to him, under all the circumstances, a matter of considerable pleasure to perform the duty, seeing that the company's operations were now advanced to such a degree that at length they thought they could see the real end of them. No one but those who had filled the office of director of a public company, charged with such duties as those which he and his colleagues had, during the last eight years, been charged with, in bringing great engineering and building operations to a close, could be aware of the anxiety, responsibility, and the worry which from hour to hour they had been subject to, and no one could imagine the pleasure which they felt in seeing those labours come to a satisfactory conclusion. That was their case, however, and that conclusion had been arrived at without any lawsuit, and without any accident of importance to life or limb. The company had now obtained an enormous addition to their plant and property, under circumstances which more than trebled their importance and capacity, and from which, no doubt for many years to come, they would receive ample fruit. The storeage, service, and filter reservoirs, on the high level, so long delayed, were at length entirely completed, in full working order, and so thoroughly answering the purpose for which the engineer designed them, that there need not be a house which was not, or could not be, copiously supplied with water from them. A work, the last of all, but not the least important, and which he shadowed forth at the last half-yearly meeting as being very necessary—namely the addition of a new receiving-tank to contain water before it was pumped up to the high levels—was being made. The operations in connexion with it were being pursued with great vigour, and at that moment the most critical part was being performed. This was the conducting of pipes under the turnpike road and the canal, so as to carry the water into the works and then into the tank, and if it was satisfactorily completed, the directors hoped that this last portion of their works would be brought to a successful termination in three months. It was a matter of very great congratulation to them that they could at length see the end of these operations, and doubtless long before the next half-yearly meeting, the directors would be able, if they thought fit, to meet in the new board-room, and discuss no longer the question of delayed operations, but questions bearing mainly on the future prospects of the company—as to their finances, &c. He thought the directors could congratulate themselves, that in these troublous times, when many railway, and most public, companies, were in great difficulty with regard to their dividends and their balance-sheets, and when an almost general stagnation of trade prevailed, they were able to lay before the shareholders such a statement of accounts as that which had been presented to them. They had expended during the eight-and-a-half years which had elapsed since their new Act was passed, £106,000, £30,400 of which had been spent during the last year alone. That was, of course, in addition to the £60,000 originally expended, 25 years ago; and a further sum of £24,000 or £25,000 might be required to pay the amount owing to the bank, and to discharge the balance due to the contractors on account of their present engagements. But, although this large sum had been expended in a comparatively short time, he found that in the year prior to the new Act being obtained their dividends amounted to the sum of £3900 only, while, at the present time, this item had risen to £7900, being an increase of £4000. Their receipts had likewise increased. In the year previous to the passing of the new Act, the gross receipts amounted to £7230, whereas now they were upwards of £11,500, or £4270 odd more per annum. These increased receipts were derived in consequence of the growth of the town, and the vast number of houses being erected. Three hundred and fifty houses, or their equivalents, had been added to the supply during the half year, 77 of them in the last month. This was a very large number indeed to be added within one month, but 23 must be deducted therefrom for demolitions by the Great Northern Railway Company; consequently, there was a net increase of 54 houses placed on the company's books in the month. There was every probability of the continuance of these extensions, and, therefore, though the directors had exceeded their income by £241, there was a reserve-fund of £5000, from which it might be made good. This would be a consolation to the shareholders, and he hoped that, at the end of the current half year, it would be found that a very largely increased income had arisen from the extensions to which he had alluded. They had, as he had observed, a margin of £5000, and, if matters were not quite so satisfactory as they could desire, he thought, under all the circumstances to which he had adverted, the position of the company was as satisfactory as could be reasonably expected. Messrs. Hawksley had recently been to Derby, and spent a considerable time in examining the plant of the company with superior tests. After making their investigations, they assured the directors that they did not believe there were above three or four towns in England where the water could be said to be better than the water supplied to the town of Derby, so that, in Messrs. Hawksley's opinion, the supply was not only sufficient in quantity, but perfectly satisfactory in quality. Stress must be laid upon that, because at their last meeting Alderman Crompton expressed a fear—which, however, he immediately dismissed on hearing facts—respecting the quality of the water. There could be no doubt that a gentleman like Mr. Crompton would not mention such a matter if he did not believe he was stating what was accurate, but he based his conclusion upon the knowledge he possessed of nuisances creeping into the river Derwent, and he assumed that the river flowed into their works, which was not the case. He (the chairman) would not again refer to the trouble and anxiety which the board had experienced; but he would remark that eight or nine years was a long time during which to be ploughing through troublesome operations, and really he did not know what the directors would have done but for the valuable services of Mr. Walker, the secretary. His services required express mention, and no tribute they could pay to him was greater than he deserved. The directors had been urged by the engineer to appoint a general manager, for he said their duties had become greater than they could perform. The matter was taken into consideration at their last monthly assembly, and they decided to defer such an appointment for the present, thinking that the right man should be chosen before making it, in order that they might feel assured that his capabilities were such as to render him suitable for so important a post.

Dr. Goode seconded the motion, which was carried.

A motion declaring a dividend at the rate of 10 per cent. per annum upon the original shares, and of 7 per cent. on the other shares, free of income-tax, was also agreed to.

The Chairman, in accordance with a recommendation of the directors, proposed that £20 a year should be added to the salary of Mr. Walker, the secretary. The board were unanimously of opinion that he eminently deserved the increase, which it was proposed should be given from the commencement of the present year.

Mr. Huish seconded the motion, which was agreed to.

The Secretary returned thanks, saying he should endeavour to do his best in the future to further the interests of the company.

Mr. J. Wright Baker said he had the pleasure, at the last half-yearly meeting, to propose that the remuneration of the directors should be increased, and he had no less pleasure in finding his motion was ably seconded, warmly supported by all present, and carried. It was well known to the whole of the shareholders how laboriously the chairman and directors had striven to promote the welfare of the company, and the satisfactory dividends they had received half yearly, and the very successful manner in which the works were being conducted, were proofs of that. He would, therefore, merely request them to confirm what they did at the last meeting, when it would be remembered he not only proposed an addition to the remuneration of the directors, but that £100 should be given separately to the chairman for his unusually laborious, long-continued, and very successful services. He now proposed that the sum of £100, voted to the chairman at the last half-yearly meeting, should be considered as an annual addition to the remuneration Mr. Gascoyne received as a director, so long as he continued chairman of the company, the increased amount to commence from Dec. 31, 1875.

The Hon. W. M. Jervis seconded the motion, saying no one could read the report without being convinced that the chairman deserved the extra remuneration proposed.

The motion having been carried, the Chairman returned thanks, referring to the assistance which he always received from the board of directors, and saying the company possessed a solid structure, which had been raised up by real energy, industry, and care.

A vote of thanks was then passed to the chairman, directors, and auditors, and having been acknowledged, the proceedings terminated.

WREXHAM WATER-WORKS COMPANY.

The Annual Meeting of this Company was held on Monday, the 21st ult.—Mr. W. Overton in the chair—when the following report of the directors was presented:—

The expenditure on capital account during the year, amounting to £4884 9s. 5d., has been chiefly incurred on account of the new reservoir at Cae Llwyd, the connecting line of main from thence to the present works at Pentrebychan, and in extending the main pipes into districts not hitherto supplied.

To meet these payments, a call has been made upon the ordinary shares, and loans have been raised upon mortgage.

The water account for the year ended the 30th of June shows, as compared with last year, an increase of £210 4s. 9d.

The total receipts for the year for water and profit upon fittings amount to £2426 11s. 6d. After payment of the usual charges, the interim dividend at 6½ per cent., the preferential dividend at 5 per cent. per annum, for the half year ended December, 1875, and interest upon the mortgage debt for the year ended June 30, 1876, a balance remains on net revenue account of £1025 0s. 2d.

The directors, therefore, have pleasure in recommending the declaration of the second half year's dividend at the rate of 6½ per cent. per annum (free of income-tax), upon the consolidated stock and ordinary shares; and at the rate of 5 per cent. upon the preference shares, and calls paid in advance, leaving a balance of £341 2s. 6d., out of which the directors propose to carry £200 to the reserve-fund, leaving £141 2s. 6d. to be carried forward to the next account.

During the year, water has been laid on to 261 dwelling-houses, making a total of 2163 now supplied.

Every year, additional evidence is brought of the estimation in which the water supplied by the company is held, and of the desirability of discontinuing other sources of supply. The War Department have decided to secure a constant supply from the company for the Bigade Depôt Barracks, at Hightown, and the company have extended their pipes to comply with the wishes of the War Office.

The directors have under consideration a proposal to extend the main-pipes to Gresford, Marford, Rossett, and Lavister, these places being part of the additional district in the company's Act of 1874.

The reservoir and works at Cae Llwyd are being pushed forward with energy, and the directors look forward with pleasure to the early completion of these works, which will enable the company to meet, for some years to come, the increasing demands made upon their resources.

Appended to this was the report of the engineers, Messrs. V. Wyatt and G. Thomas, which was as follows:—

We beg to inform you that the works of the Cae Llwyd reservoir are very well advanced, the weather having proved exceedingly favourable this season.

There is every probability that the reservoir itself will be completed by the end of this year, with the exception of the pitching to the slopes, and other minor works, which will be completed in the spring of next year, after the earthwork has been consolidated by the winter rains.

The CHAIRMAN said he had much pleasure in meeting the shareholders at the close of another year, inasmuch as the company's works had been progressing satisfactorily in every way. On looking over the statement of the accounts, they would see that on the revenue account there was an increase of £251 as compared with the previous year; thus the water and the fittings together showed an increase of about 10 per cent., or a third more than in 1874, while it might be noticed that the general average increase in water-works companies during that period had not exceeded 5 per cent. In the year 1869 the revenue of the company was £11,000, so that since then an increase of nearly 70 per cent. had taken place, in the face of the general stagnation of trade in the district, which must affect the company, although they did not so much depend upon the large consumers as upon the regular domestic supply, as the latter was not so liable to fluctuation as the former. It would be observed that the directors had under consideration a proposal to extend the main-pipes to Gresford, Marford, Rossett, and Lavister, those places being part of the additional district included in the company's Act of 1874. By so doing they would be carrying out and supplying a public want in that district, and after very carefully considering the proposed extension, it was found that the outlay necessary would prove remunerative, and serve the best interests of the company. He was happy to say that the new works were progressing rapidly and favourably, and before their next meeting he hoped to be able to announce them as entirely completed. They had laid the mains to Stansty, Wheatsheaf, and Pentre Broughton, in some instances under a guarantee from a sanitary authority, but in all cases to best serve the interests of the shareholders. When their new works were carried out, and the two reservoirs completed, the company would be in possession of very complete works, such as would serve their wants for a number of years to come. In concluding, he moved that the report of the directors and the statement of accounts, as produced, be received and adopted.

Mr. DAVENPORT seconded the motion, which was agreed to.

The CHAIRMAN proposed that an interim dividend, at the rate of 6½ per cent. upon the consolidated stock and ordinary shares, and at the rate of 5 per cent. upon the preference shares and calls paid in advance, be declared.

Mr. EDWARDS seconded the resolution, and it was unanimously carried.

It was resolved, on the motion of Mr. LINDOP, seconded by Mr. HUGHES, that the retiring directors, Messrs. Edward Davies and Joseph Clark, be re-elected; and it was further resolved, on the motion of Mr. HADEN, seconded by Mr. EDWARDS, that Mr. Wynne Jones be re-appointed one of the auditors.

The Rev. T. KIRK expressed his pleasure at the satisfactory manner in which the interests of the shareholders were studied, by the efficient way in which the company's affairs were directed, and moved that the sum of £100 be paid to the directors as an acknowledgment of their services.

Mr. E. EVANS seconded the resolution, and it was carried *nem. dis.*

It was resolved that the directors be empowered to raise a sum not exceeding £10,000, to meet the expenses connected with works in progress; after which votes of thanks were unanimously passed to the chairman and Mr. F. Storr, the secretary of the company.

DUDLEY WATER SUPPLY.

The Official Inquiry, opened by Mr. BATEMAN on Aug. 4, into the efficiency of the Water Supply of the South Staffordshire Water-Works Company to the town of Dudley, was resumed on the 23rd ult.

At the sitting on Aug. 4, the MAYOR of DUDLEY (Mr. Stokes) opened the case by reminding Mr. Bateman that the inquiry arose out of a duty imposed upon the Town Council to see that the inhabitants of the borough were properly supplied with pure and wholesome water. The corporation alleged that the company had not discharged the duties incumbent upon them under the statute. There had, indeed, been a total failure on their part to fulfil the obligations which the statute imposed upon them, and he might say that where the company failed to discharge a statutory obligation, it was a misdemeanour at common law. Knowing this, the corporation, after adopting every other means at their disposal, preferred a bill of indictment against the company. A true bill was found against them, and it came on for trial at the Worcester Assizes, when an arrangement was come to, the terms of which had been published, and were to the effect that the matter should be referred to Mr. Batemen, C.E., who should decide as to what was required to remedy the alleged impure and deficient supply. Referring to the past history of affairs, the mayor stated that, before the South Staffordshire Water-Works Company came into existence, there was a Dudley Water-Works Company, but the former bought up the latter in 1862. They took all the obligations of the company; but there was one exception, and that was that, instead of being compelled to supply water to the highest room in the borough, they were only compelled to give the pressure which the district reservoir afforded. The company's water came from Lichfield, and was pumped to Walsall, from thence to Wednesbury, then to Conegre, and so on to Dudley. There was plenty of water, but from defects in the machinery, &c., Dudley was frequently without water, and very often with only a partial supply. The water was also frequently impure. The mayor, in support of his statements, read a long correspondence between the corporation and the company. This showed that the council, the guardians, the clergy, and the inhabitants had, over and over again, complained of the deficient and the foul supply, and the company had made excuses and promises, all of which had not been fulfilled. The letters extended from 1871 to 1876. The mayor quoted from Dr. Thorne, who was sent to the town in consequence of fever, and this gentleman said that the water supply was often deficient and often impure, containing occasionally portions of dead fish. The company had admitted that the water was of first purity at Lichfield, and that any dirty water was local and accidental. The corporation would be glad of the water as at Lichfield, and the company must explain the local contamination. The mayor, in continuation, said the medical officer of health and the chief superintendent of police had often complained of the want of water. At last, the corporation summoned the company, and after a three months delay the magistrates appointed an engineer to report on the causes of the deficient and foul supply. This engineer reported that the engines were old and working wastefully. Upon this report the company paid all the expenses, and gave a promise that the matter should be remedied. The summonses were withdrawn, but the water still was deficient and impure, as witnessed by Dr. Ballard, who was sent from London to inquire into the prevalence of zymotic diseases. Dr. Ballard complained of the water; and, again, in November, 1874, the mayor, by public petition, called a town's meeting, which passed a strong resolution insisting on the council taking prompt and decisive action against the company. The mayor then detailed the action taken by the council to oppose the South Staffordshire Water-Works Company in Parliament on the occasion of the latter applying for extension of powers imposing pains and penalties on consumers. Various concessions were made, but the council were told that other matters would have to be decided in the law courts. With a challenge like that, the council went into the law courts, and, before a judge, a bill of indictment was filed and heard. That brought them to that day, when they were still suffering as they were in 1871. The company could not say they were harshly treated, for, before going so far as the law courts, he (the mayor) wrote to the company, telling them what he was going to do. That letter was never answered. The mayor then produced a dozen bottles of filthy-looking water, which had been drawn by himself and other gentlemen in the town. He also read the report of Mr. Stevenson, C.E., as to the capabilities of the company's works. That gentleman condemned the open reservoirs of the company, because they encouraged vegetable growths, and received all the smoke and dust from the coke furnaces, passing trains, and clouds of mineral dust. The reservoirs should be covered to keep them cool, and free from objectionable matters. He (the mayor) also read an opinion from Professor Frankland, who condemned the water and the open reservoirs. In conclusion, he said the Local Government Board would compel the Town Council to have a good water supply, and they could only get it by forcing the South Staffordshire Water-Works Company to supply the town. With the assistance of the inspector, they hoped to obtain a proper supply.

Mr. BATEMAN gave notice of information on various points which he should require, and said it was quite evident the inquiry would have to be postponed in order that this might be supplied, and that Mr. Wainwright might have a fair opportunity of replying to the statement of the mayor. He would, however, visit and inspect some of the company's works in Dudley.

The MAYOR suggested that the ground should be cleared as much as possible, and it should be then decided how far, at the adjournment, they were to go into the question of facts.

Mr. WAINWRIGHT said they might take it that occasionally, during the period the mayor had spoken of, there had been an impure supply, and the quantity had been occasionally insufficient, but only under circumstances which he might be able to explain.

The MAYOR suggested that neither party should call witnesses, but simply hand both their briefs to Mr. Bateman.

Mr. WAINWRIGHT thought that he should be heard in reply to the observations which had been made by the mayor.

Mr. WAINWRIGHT, who now appeared for the South Staffordshire Water Company, replied at great length to the statements made at the previous sitting by the mayor, on behalf of the Town Council. He then proceeded to the company's bill of 1875. By that, he said, they had obtained power to construct the new works which Mr. Bateman had seen on the previous day, and that gentleman was no doubt satisfied that they had set to work to carry out the provisions of the Act as rapidly as possible. There was not a single work authorized by the Act which was not at present under contract. All the land had been acquired; there were contracts for the erection of the engines, for the sinking of the wells, for the laying of the pipes, for the construction of the reservoirs, everything, in fact, they proposed to do under that Act they had pushed forward, and it was the anxious wish of the directors of the company that everything that could be done should be accomplished in order to improve the supply of water to the Black Country, and to Dudley in particular. All these works he (Mr. Bateman) saw yesterday, and must have been satisfied that the company were honestly proposing to carry out the powers of the Act. The company believed that when the works were completed, the effect of them would be to double the quantity of water they could introduce into the district, and every cause of complaint, not only in that town, but every other place within the Black Country, would be entirely and absolutely removed. They ventured to claim at Mr. Bateman's hands some consideration on those grounds, asserting, as they did, that they were most honestly and sincerely pressing those works forward, with the view of putting an end to all possible charges and complaints. He believed the whole of those works would be completed and in operation before the end of next year. It depended upon the contractors, and, if they did their duty, the works could be carried out by the time he had named. They had reason to hope that in less than two and a half years from the passing of the Act of 1875 everything contemplated by that Act would be completed. When this was achieved the company would pump directly from Wood Green to Shaver's End. From that place, in point of fact, water from Lichfield would pass up to Shaver's End, and supply the branch mains in Dudley as they came up, without the intervention of any intermediate reservoir at Conegre or any other place. The only other matter that he thought remained for him to notice was the complaint that had been made with reference to the purity of the water. He (Mr. Bateman) had seen the source of supply, and this, he should think, would lead him to the conclusion that the water was perfectly free from pollution. He did not pretend to say that impure water was not drawn from the company's pipes, but that that was the rule he entirely denied. Specimens had been carefully and industriously collected in support of the case attempted to be made against the company. They had been treasured up, and the more dirty the water could be found, possibly the more satisfactory it was to those who had the matter in hand. These were preserved in order to be used with some sort of effect against the company, but it was not thought necessary to produce those samples before the committee of the House of Lords. When they got to Parliament, and were applied to for particulars of the grievances complained of, the names of certain gentlemen of position and character in that town were given as complainants. Not one of those prominent gentlemen had at any time thought it necessary to come to the company, or to any official, or even to a turncock, and complain that the water was unsatisfactory. They were left without any knowledge that that kind of mine would be sprung upon them when they had not an opportunity of examining into it. No doubt turbid water had been supplied, but he utterly repudiated the insinuation that such was the character of the company's ordinary supply.

Mr. BATEMAN observed that it might be quite true, as admitted by Mr. Wainwright, that the water had been occasionally bad. He had himself that morning seen water in his rooms, at the bottom of which there was a considerable amount of dirty sediment, whilst the water in his glass was clear and bright. The latter, he was told, had been filtered, but all of it was delivered through the company's pipes. It ought really to be the same water they got from Lichfield.

Mr. VAUDERY: The water even there might throw down a deposit, though apparently clear.

Mr. BATEMAN thought, however, the reservoir at Conegre was a bad place. It ought to be absolutely abandoned, for they could not do otherwise than get a dirty supply.

Mr. VAUDERY said they proposed to make filter-beds at Conegre, so that if they occasionally had to supply thence after the completion of the proposed works, the water would be filtered before distributed.

After several questions had been put and answered,

Mr. BATEMAN inquired whether, if the Conegre pumping-station, which was supplied direct from Lichfield, received pure water, which ought to be sent on, and if the Conegre pumping-station were exclusively devoted to certain districts, with the obligations of the company to put down additional pipes so as to meet the demand upon them, and the water should be so stored as not to be foul, that would be satisfactory to the corporation?

The MAYOR: No doubt it would.

Mr. BATEMAN: Now, as to the time.

Mr. JAMES: We have pushed these works on very much, and we believe we shall do in three years that which Parliament gave us five years to accomplish.

Mr. BATEMAN: Suppose we give you three years from the present time?

Mr. JAMES: That would be ample, supposing we get no difficulties in the way which we cannot foresee.

Mr. BATEMAN thought it would not be hard upon the company if he gave three years to complete the works, and that Conegre pumping-station should, in the mean time, be exclusively employed to supply Dudley and contiguous districts, the Shaver's End reservoir, as at present; and that after, subsequent to the completion of their arrangements, Conegre pumping-engine to be employed to the service parts of the Dudley districts as could not be reached by the Shaver's End reservoir.

The MAYOR said that, after the completion of the works, it appeared that they would be dependent upon one engine at Wood Green. He asked for a reserve engine.

Mr. VAUDERY replied that it was fully intended to put down a duplicate engine.

Mr. BATEMAN, having made further inquiries, and memoranda for use in drawing up his report, thanks were tendered to him by the MAYOR and Mr. JAMES, and the inquiry terminated.

A VISIT TO THE LEEDS CORPORATION WATER-WORKS.

The *Leeds Mercury* gives a long and interesting account of the annual official visit of inspection paid by the members of the Leeds Corporation, on the 17th ult., to the extensive water-works which supply the town of Leeds. We make a few extracts from the report.

Accompanying the party were Mr. Filliter, the water-works engineer; Mr. Morant, the borough engineer; and Mr. Clarke, inspector of the water-works. The first stoppage was at Headingley pumping-station, where the two engines which supply the Bramley and Chapeltown districts were seen at work. The additional ground purchased for the erection of new engine-houses was also inspected. Leaving the pumping-station, the party proceeded to Eccup, passing on the way, without stopping, the filter-beds at Westwood. Mr. Filliter explained the filtering process, and said that the seven beds, which extended over five acres, were filtering about 8 million gallons per day. The first three beds had been made about fifteen years ago; other four had afterwards been formed; and now he proposed that an additional ten or twelve acres should be purchased on the opposite side of the road for the enlargement of the filter-beds. This is one of the objects contemplated in the application about to be made to Parliament for a new bill. Another important object, which will be included in the same bill, is the enlargement of Eccup reservoir. Mr. Filliter pointed out the extent of the proposed addition, and the site of the proposed new embankment. The Eccup reservoir is the original one constructed by the water company. It is 43 feet 6 inches in depth, but at the time of the visit the depth of water was about 35 feet. It contains when full about 250 million gallons, of which, however, only about 200 million gallons are really available under present arrangements, owing chiefly to the smallness of the exit-valves, which, when the level of water in the reservoir falls to a certain point, do not allow sufficient water to pass them to keep up the supply to Leeds. When the accident occurred last summer to the Cornish engine at Arthington, about 215 million gallons were in store, of which about 175 millions of gallons were available—equal to about 3½ weeks full supply to Leeds. The repairs to the Cornish engine occupied 5½ weeks, and if the twin engines had also been disabled the town would have been left without water. Even with the large reduction of 1½ million gallons per day effected in the demand by shutting off at night, the available quantity left in Eccup reservoir when the Cornish engine was again able to work was only about 55 million gallons, or less than ten days supply to Leeds at the reduced rate, notwithstanding the help given by the twin engines. Mr. Filliter having stated these facts in a report, showed that if the Eccup reservoir had been four or five times as large as it really was, this serious condition of things would not have existed, as the quantity in store would have been sufficient to have maintained the full supply until the repairs to the engines had been effected. It fortunately is possible to enlarge the Eccup reservoir to this extent at a moderate cost, and to make the whole quantity of water contained in it available, by constructing a new embankment about two-thirds of a mile below the present embankment at the point where the valley narrows to a gorge. The height of this new embankment will be 75 feet, and its length will be about 200 yards. It will hold up the water to the same level that the existing embankment does, and if the latter were removed the two portions would form one reservoir, containing 1100 million gallons, being an addition of 900 million gallons to the present available storeage. Such a quantity of water would serve Leeds at its present summer rate of consumption, without aid from any other source, for nearly 22 weeks, or for about five months, and would render the town perfectly independent of the occurrence of accident to either the pumping machinery at Arthington, the mains between Swinsty and Stubhouse, or the Stubhouse conduit. Among the other advantages which would result from the enlargement of the reservoir, Mr. Filliter stated that the two 30-inch mains which have been laid to bring water from Swinsty reservoir into Eccup, could, during winter, when Swinsty reservoir would be nearly full, pass much more water than in summer, when it might be partly empty, owing to the greater head placed upon them by the reservoir when full. If the reservoir were enlarged as suggested, much of the surplus flow of water might be sent forward by these mains into it, and stored there during the winter in readiness for the next summer's use, to an extent five times greater than in the present reservoir, thus rendering these mains so much more useful, and saving the cost of pumping at Arthington every summer. Further, if a very long drought (say for six months) should occur in any year, the quantity stored in winter by the enlarged Eccup reservoir would for that period increase the total available supply from all sources (including pumping) about 4½ million gallons per day. Again, the three reservoirs at present being constructed in the valley of the Washburn will, in a very dry season, give 5½ million gallons per day by gravitation, and 6 million gallons per day by pumping; while a further 1 million gallons per day is obtainable by gravitation from the Eccup gathering-ground, making a total of 6½ million gallons per day by gravitation, and 6 million gallons per day by pumping that would be available in a dry year. At the present time Leeds uses in the summer time, when not checked by shutting off at night, about 7½ million gallons per day, and pumping must henceforth be resorted to during a part of every dry summer until more reservoir room be provided than is at present being constructed. By the enlargement of Eccup reservoir as suggested, the 4½ million gallons per day thereby made available by gravitation would enable the corporation to cease pumping at Arthington until the summer demand in Leeds attained to 11 million gallons per day, which at the rate of increase of the last ten years (namely 274,600 per day per year) would not be until the year 1889. The enlargement would be much less costly than the construction of a fourth reservoir in the Washburn Valley, as no expensive weirs, bye-washes, and tunnels would have to be built, and the present embankment could be carried back, and the whole formed into one large reservoir of nearly 200 acres. The cost of the proposed embankment, and of putting a stopping and shaft with sluice-valves into the existing tunnel, which brings the water from Eccup to Leeds, Mr. Filliter estimates at about £50,000. Fully 150 acres of land would be required, the cost of which would have to be added, making the total about £65,000 It was explained to the members that if the enlargement were carried out, the water in this reservoir could not be taken to compensate millowners, and that the present cost of pumping 900 million gallons—£1800—would be saved. Proceeding next to Lindley Wood reservoir, the point at the Washburn foot was passed where the water is gauged for the millowners on the one side and for the water-works on the other, 4 million gallons daily being passed into the Wharfe as compensation water for millowners, and 6 million gallons being conveyed to the pumping-station at Arthington. On arrival at Lindley Wood reservoir the party walked across the massive embankment, inspected the substantially built masonry, and then proceeded along the north side of the reservoir to Lipper's Ford Viaduct. At the time of the visit there were 29 feet 6 inches of water in the reservoir, which is capable of containing 750 million gallons. It was completed a few weeks after the visit of the corporation last year. At the Lipper's Ford Viaduct, as the busses had now to pass over a very heavy road two of the horses were unyoked from each, and four of the splendid horses kept by the corporation for use at the works were attached to each omnibus. Even with seven horses in each it seemed hard enough work to get over the road to Swinsty reservoir, which was reached at two o'clock. At the last annual visit the works were in a very unfinished state, but now the reservoir has 28 feet of water in it. It is the largest of the Washburn reservoirs, and has a storeage capacity of 960 million gallons. The byewash and weir were carefully inspected, and also the tunnel through which pass the two 30-inch gravitating mains. The connexions with these mains will be complete in a few days, and then a plentiful supply can be conveyed direct to the Eccup reservoir. Fewston reservoir, a short distance above Swinsty, was the next stopping place. This reservoir "tails up" about 1¼ mile, and when completed it will hold 866 million gallons. Divided between the two reservoirs, there are fully 500 men at work at present, the greater number at Fewston. Bricklayers are hard at work upon the tunnel, or culvert, which is 11 feet in diameter, and which will be completed in a month. The river will then be diverted through the culvert, and the work of forming the puddle trench and building the embankment will be proceeded with. The puddle trench has been opened out and found to have an excellent water-tight bottom. It is 524 yards long, 24 feet broad, and, in some places, 80 feet deep.

PROPOSED PURCHASE OF THE HANLEY GAS-WORKS.

The Quarterly Meeting of the Hanley Town Council was held on Tuesday, the 29th ult.—the MAYOR (Mr. John Baker) in the chair.

A letter was read from the secretary of the British Gas Company, stating that the communication of the council had been laid before the directors, who instructed him to inform the council that when the directors consented to meet the mayor on the proposed purchase of their Etruria works by the Corporation of Hanley, it was simply an act of courtesy to him, and in no way to be construed into an intention on their part to alter their former refusals to entertain the proposed purchase of their works. On the contrary, the directors entertained an opinion strongly adverse to the sale of any of the works belonging to the company.

Mr. HAMMERSLEY said, after the snubbing the ex-mayor had received from the gas company, they could hardly expect the council would fare better. He thought there was sufficient reason for the council tackling this question firmly and determinedly, and he proposed that the General Purposes Committee be constituted a Gas-Works Purchase Committee, and be empowered to take counsel's opinion as to the best manner of proceeding to acquire, by parliamentary powers, the undertaking of the British Gas Company.

Mr. CARTLEDGE seconded the motion.

Mr. BEBBINGTON said, after what had taken place, and knowing the advantages which had been derived by other towns from taking to the gas-works, and in view of the refusal of the gas company to enter into any negotiations with the council, it was time for the council to understand their position, and, in the first place, to ascertain the cost of an opposed bill for acquiring the gas-works.

The MAYOR said he thought the company had shown great discourtesy to the council. Mr. Linging, the manager of the Etruria works, had called upon him, and promised that a deputation of the directors should see the council, and he thought the council, as large customers, were entitled to courteous treatment. It was time for the ratepayers to come forward and protect themselves in the matter of gas.

Alderman RIDGWAY reminded the council of the efforts of Burslem to obtain possession of gas-works under a Provisional Order, and suggested that they should wait and see the results of those efforts before they involved themselves in the very large outlay necessary for obtaining an Act of Parliament. He believed in the desirability of purchasing the gas-works, but he wished it to be done in the most economical way.

Alderman PIDDUCK coincided with the last speaker. He believed the possession of the gas-works by the council would be an advantage to the town, if they could get them at a reasonable cost. An opposed bill might cost the town £2000, and, perhaps, by waiting a year, they might be able to avoid that expense.

Mr. POWELL said the question of opposition by the gas company would not influence him in the course he should take. Whenever they proceeded to acquire the works they would have to fight the company, and it seemed that the only course was to go to Parliament and ask for an Act. The sole difficulty was that which had cropped up in Burslem, as to lighting outside their boundaries, and, if that could be got over, let them go to work at once, and obtain possession of the gas-works.

Mr. COOKE said the same difficulty cropped up in Birmingham, and had been settled satisfactorily. Mr. Hammersley said with regard to the supposed difficulty as to supplying gas outside the limits of the borough, the position of Burslem was simply this: The local board agreed with the gas company for the purchase of the gas-works, and thought they could carry out that agreement by means of a Provisional Order; but they found they could not, because the clause of the Local Government Act limited undertakings for which Provisional Orders might be granted to the area of the local authority. In the case of a municipal borough going to Parliament for an Act, it was very different, as in the case of Birmingham, which had obtained powers to supply gas as far off as Walsall. At Longton they might have applied for a Provisional Order, but the company went to Parliament for powers to sell the whole of their undertaking to the council, and they had no difficulty whatever. They were told they would lose nothing by waiting, but he thought they would lose by waiting. The gas company were put upon their mettle, and were making every exertion to expend the £30,000 additional capital lately raised, and upon which the council would have to pay, perhaps, something like 7 per cent. interest if they purchased the works, so that every day's delay would enhance the value of the property. He contended that a considerable revenue would come to the town from having its own gas-works, and quoted figures to show how much would be saved in the expenses of management. They had everything to gain by going to Parliament at once, and the only question to consider was whether they could satisfy the committees of the House of Lords and the House of Commons, which he had no hesitation in saying they could, that it would be for the benefit of the town to have the control of its own gas-works. The decision in the case of the Birmingham Corporation Water Bill settled the principle that it was desirable for corporations to have the control of works of this kind.

The resolution was carried.

GRIMSBY GAS COMPANY.—The half-yearly meeting of shareholders was held at the company's offices, on Thursday last. The report recommended a dividend of 10 per cent. per annum on the consolidated A and B stock for the half year ending June 30 last, and of 7 per cent. on the new ordinary shares. The report was unanimously adopted.

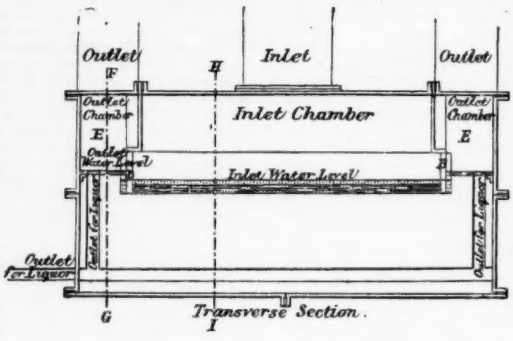
FIRE FROM AN ESCAPE OF GAS.—The *Manchester Examiner* of the 22nd ult. says: "An extraordinary scene took place, late on Sunday night, at Chorley, primarily caused by an escape of gas from the main. It seems that the smell of gas had been noticed in a stone-built cottage in Leigh Street; but there being no service of gas therein, nothing further was thought about it, and at night some person went with a light into the back kitchen, when a volume of gas near the slopstone got ignited, and in a short time the whole of the building was a mass of flames, and the utmost excitement prevailed. The fire-engine was soon on the spot, but the water thrown on the flames had no effect, and loud explosions, like the report of firearms, followed in rapid succession. At length it was discovered that the only effectual way to extinguish the fire was to cut off the gas-main, and this was done, when the fire ceased. The front of the building had to be propped up, as there was a fear that it would fall in."

LIVESEY'S IMPROVEMENTS IN APPARATUS FOR PURIFYING GAS.

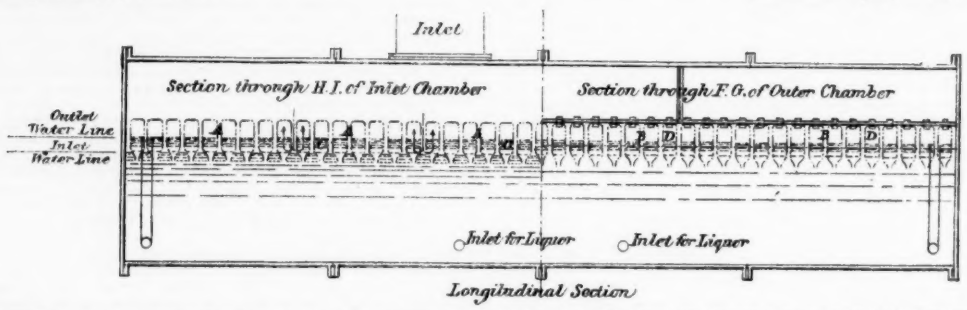
[In our "Register of New Patents" on the 22nd ult., p. 283, we recorded, in chronological order, the invention of Mr. G. Livesey, of the South Metropolitan Gas-Works, for improvements in apparatus for the purification of gas, of which the following is a description.]

The invention consists in the construction of apparatus whereby the more complete removal of ammonia, tar, and other impurities contained in coal gas is effected. This is attained by the very minute subdivision to which the gas is subjected, and by bringing the small bubbles into very intimate contact with the liquid used in the washer, while the liquid is, when gas liquor is employed, increased in value.

The specification describes one or more oblong, square, or other suitably shaped but somewhat shallow boxes, chambers, or vessels, divided by vertical partitions, A, to the lower part of which are attached perforated plates bent and fastened as shown in the drawing, the ends, B, being closed. The shape of these perforated plates may be varied without affecting the principle of the general arrangement. The curved or lower part of each partition is perforated with a great number of holes of about 1-16th of an inch in diameter, more or less, and between every alternate partition a horizontal plate, C, also pierced with fine holes of about the diameter before mentioned, is fixed to the partitions. It is preferred that two or more of these boxes, chambers, or vessels, technically called "washers," shall be placed side by side at different elevations, so that the liquid supplied to the highest vessel may, by a suitable pipe, flow to the next lower one, and from that to the next, and so on.



Each vessel being supplied with either water, ammoniacal liquor, or other suitable liquid,



the gas is admitted to the lowest vessel, when it descends between the partitions before spoken of, depresses the liquid contained therein, and escapes through the perforations in the sides into the spaces covered by the upper part of the perforated plates. The gas then continues its passage through the liquid and the apertures in the upper part of the perforated plates, and passing through another stratum of liquid, emerges into the space above, marked D, from whence it proceeds to the side chambers, E E, and thence to the next vessel above, where the operation is repeated. The repetition of the process may be made as many times as there are vessels in use. The liquid employed in the upper vessel may be ordinary pure water where there are no scrubbers, but when scrubbers are used the liquor may flow from the scrubbers to the washers.

Each vessel is furnished with a suitable pipe for the delivery of liquid, and also an overflow-pipe from which the liquid descends to the next vessel. Suitable inlet and outlet pipes for the gas are also provided, together with valves so arranged as to form bye-passes, and allow of any one or more of the vessels being thrown out of action.

The inventor does not confine himself to the precise details or arrangements above described, as variations may be made therefrom without deviating from the principles or main features of his invention. He simply claims as novel and original the construction and application of a chamber or chambers wherein vertical or inclined perforated plates in combination with horizontal plates similarly perforated, immersed or partially immersed in suitable liquid, are used as described and shown in the drawings. His object has been to effect the most intimate subdivision of the gas, in contact with water or liquor; and that he has succeeded in this is evident, from the fact that, during the last half year, he obtained, from precisely the same coals, 14 per cent. more ammonia than before.

IRON AND COAL TRADES OF SHEFFIELD, SOUTH YORKSHIRE, AND NORTH DERBYSHIRE.

(FROM OUR OWN CORRESPONDENT.)

The blow which has at last fallen on the Cleveland district, in the shape of the liquidation of Thomas Vaughan and Co., is severe, but it is by no means a surprise, inasmuch as the series of meetings recently held at York by the leading creditors of the firm have been pretty fully reported, even if inaccurately in some respects. It is well known that several other houses in the Northern district will now have to seek the protection of the court, but it is not thought that the firms here, which hold their paper, will be seriously affected. There has been one failure here during the week, to the tune of £40,000, indirectly owing to a connexion with a Cleveland shipbuilder, but I believe that no worse results are to be feared.

There is no very marked change to note, as having occurred this week, in the condition of the local iron, steel, hardware, and coal trades. The pig iron departments are quiet as a rule, the output of the district furnaces being still greatly in excess of the requirements of the finished iron makers. Some few lots of foundry pig, it is true, continue to change hands, but they are on a very small scale indeed. In hematite pig iron, too, there is a little business doing, some of the Bessemer steel producers being fairly well engaged.

The annual report of the directors of the Sheepbridge Coal and Iron Company, Limited, is a document which well illustrates the depressed state of trade. The directors say that owing to the wholly unprecedented depression of all branches of the iron trade they have been unable to make any profit at all during the last half of their financial year—a state of things largely brought about by the strike of miners, but not altogether attributable thereto. During the first half of the year they made £1800 odd profit, out of which, with a balance brought forward, they recommend a dividend at the rate of 8 per cent. The company have a number of collieries, six or seven blast furnaces, and large iron-works.

The brass manufacturers are only indifferently engaged, few articles of the ordinary description being in demand. Special plumbers fittings, of a kind conforming with the regulations of the various water companies throughout the country, are, however, being produced, and sold with tolerable freedom. Gas-fittings are in rather better request, consequent upon the approach of winter.

There is no quotable change in the price of coal, although (as I stated last week) colder weather has had the effect of increasing the household demand. At the time of writing, there is a most abundant supply, with the colliers only working about three days weekly.

THE COAL AND IRON TRADES OF LANCASHIRE.

(FROM OUR OWN CORRESPONDENT.)

In gas-making coals, the market continues to exhibit a tendency towards stiffness, and contracts cannot now be so readily placed at the low prices which were being accepted a month or so back, whilst the raisers of cannel who have not yet contracted for their get, are talking of advancing their prices two or three shillings per ton. So far as the current market quotations of gas coal are concerned, there is no very material change; ordinary screened qualities at the pit's mouth, in the Wigan district, ranging from 8s. to 9s. per ton, but there is an absence, to a great extent, of the low offers which were being made to secure business.

There is also, if anything, rather a healthier tone in other descriptions of coal, and prices have evidently now gone as low as they possibly can. There has been a little more inquiry for the better classes of round coal for house fire purposes, and burgy and slack are in fair demand, the latter class of fuel being, if anything, rather scarce. There is, however, still no push for any description of fuel, and supplies in the market, notwithstanding the present restricted production, are plentiful. The average pit prices in the Wigan district remain about 10s. to 11s. per ton for Arley; 8s. 6d. to 9s. for Pemberton four-feet; 6s. 6d. to 7s. for common coal; 5s. 6d. to 6s. for burgy; and 3s. 6d. to 4s. 6d. per ton for slack.

The shipping trade continues very dull, and the prices offered are too low to induce any but needy sellers to push for business, good Lancashire steam fuel, in flats alongside at Liverpool, being obtainable at 9s. per ton.

The colliers strike in the Farnworth district is now at an end, the men having returned to work on the masters terms—viz., a reduction in wages of 15 per cent. In the Oldham district, however, the men continue on strike, but the colliery proprietors show no signs of giving way, as they have no difficulty in obtaining supplies for their customers from other quarters.

The iron market here has again been very much unsettled by the disturbed state of things in the Middlesbrough district, and the collapse of Thomas Vaughan and Co., which it is asserted will lead to other embarrassments. A number of cheap lots of G. M. B.'s have been offering in the market, but the local makers of pig iron have made no change in their quotations, which remain at 56s. to 57s. per ton for No. 3 foundry, and 53s. per ton for No. 4 forge, delivered into the Manchester district, and although nearly the whole of even their present limited production is going down into stock, they are not disposed to push sales at lower prices. The finished iron trade continues very depressed, and prices are low. Local makers of ordinary bars would accept good specifications at from £6 15s. to £6 17s. 6d. per ton, delivered into the Manchester district.

The position of the various works remains very unsatisfactory, and many of the rolling-mills are not running more than three or four days per week.

THE COAL AND GENERAL TRADE OF THE NORTH OF ENGLAND.

(FROM OUR OWN CORRESPONDENT.)

The September shipments of gas coals have commenced. They were pretty considerable from the Tyne Dock last week, and are likely to continue so during the whole of this month. Best qualities of gas coals are pretty firm in the market, but of all kinds of inferior gas coals there is an abundance; prices are, therefore, somewhat low and irregular. Household coals are in better inquiry, and the demand for steam coals, especially the better sorts, is remarkably well kept up. There is nothing special doing for the bye-ports, as the harvest has not yet been all got in apparently. There were few orders in the market, and no small sailing vessels to take them. Small sailing ships have been detained in their passage down from the south by contrary winds. The court of arbitration, to consider the proposed reduction of wages in the Durham district by 15 per cent., sat two days last week in Newcastle, and adjourned to the 16th of September, when the arbitrators will endeavour to come to a decision; but if the subject cannot be settled by them, it will be referred to Mr. Shaw Lefevre, M.P., the umpire. The Northumberland arbitration will be brought on in a fortnight.

The freight market is without much change, except that Mediterranean outward rates get lower. They were down last week 5s. per keel below the moderate freights of the past month. Coasting freights are also quiet, and cannot be quoted at more than 4s. 6d. for steamers to London. On account of the scarcity of small sailing shipping in the coal ports, about 6s. per ton has to be paid to handy little sailing vessels to discharge coals at the wharves in London river. More business is doing from Spain and Africa, and a few steamers are employed in that trade. The homeward business in corn is very moderate indeed.

The failure of Messrs. T. Vaughan and Co., according to the reports in the London Bankruptcy Court, with liabilities of one million of money, with the fact that some other large firms, as reported last week, were in a critical condition, has caused very serious depression in trade in the North of England generally. There seems to be an entire want of confidence in commercial circles, and the prospects of trade look to be getting worse rather than showing any signs of improvement. More men are likely to be thrown out of employment as the winter approaches.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

At the monthly meeting of the Town Council of Dumfries, held last Friday, Mr. Wood gave notice that, at a meeting to be specially called on the 22nd inst., he would move that the Burghs (Scotland) Gas Supply Act be adopted in, and applied to, the burgh.

It may be remembered that recently the Police Commissioners of the burgh of Maxwelltown had some difficulty with reference to the price of the gas supplied for the street-lamps by the gas company of the adjoining burgh of Dumfries, and that the former threatened to adopt the system of lighting the streets with oil. The suggestion coming under the notice of a Birmingham firm, they communicated with the Maxwelltown Police Commissioners, offering to supply lamps on trial, which would be placed within the present street-lamps, and stating that Winchester, Launceston, Brixham, Poole, and other towns in England, were lighted with them. Two of the lamps were accordingly tried last Tuesday night, charged with two pennyworth of paraffin oil in each. They burned from eight o'clock at night till nine o'clock next morning, and a general opinion was expressed that their light was brighter than that given by the gas-lamps burning on the Dumfries side of the river. Four lamps were tried on the following night, and large numbers of the inhabitants witnessed the experiment with a keen interest.

An adjourned meeting of the Gas Commissioners of Forfar was held last Thursday night—Bailie Grant in the chair—when the consideration of the committee's recommendation, that the price of gas be reduced from 6s. 8d. to 5s. 10d. per 1000 cubic feet, was resumed. Mr. Rutherford and Mr. Craik pointed out that the proposed reduction still left a large surplus—a surplus, in fact, sufficient to warrant a further reduction of 10d. per 1000 feet. It was objected by the convener that, inasmuch as an outlay of £5000 for a new gasholder would have to be entailed in five years, a reduction to 5s. would be imprudent; to which it was replied that it was not fair to tax the present consumers for those of the future. Ultimately it was agreed to reduce the price to 5s. for a half year.

The Town Council of Glasgow had the minutes of the Gas Committee under consideration at their ordinary monthly meeting last Thursday, and a discussion arose regarding the proposal of the committee to charge the Police Board at the rate of 4s. 2d. per 1000 cubic feet for the gas consumed in the street-lamps and by the stair-lights. One member objected to such a charge, and moved—"That it shall be remitted to the auditor to ascertain the cost price of gas to be supplied to the Police Board, and charge accordingly." The minutes were adopted by 27 against 7 votes for the amendment. The subject of Mr. Foulis's stoking machines was also under consideration, the Gas Committee having recommended that an offer to supply two of them for the Dawsholm works, at a cost of £1140, by Messrs. Adam Woodward and Sons, Manchester, be accepted. It was stated that Mr. Foulis had, in disposing of his patent, made it a condition that in all time coming the Glasgow Corporation Gas Commissioners should have the use of the machines free of any patent right charges.

The Police Commissioners of Forfar have resolved, by a majority of six votes to five, to adopt Mr. Bateman's report on the proposed water supply scheme for the burgh.

At a meeting of the Kirkwall Police Commissioners last week, a report from Mr. Leslie, C.E., on the water supply, drainage, and paving of the burgh was read, as also one from a committee appointed to consider the subject. The total estimated cost of the scheme is £10,000. The report was allowed to lie on the table for a fortnight.

A new and excellent supply of water has just been introduced into Dalmellington, an important mining village in Ayrshire.

Numerous complaints have lately been made regarding the very limited supply of water which is being obtained in certain districts of Edinburgh, and the matter is likely to be brought formally under the notice of the Water Trustees at their next meeting.

The Glasgow pig iron market was somewhat firmer about the middle of the past week, and prices went up to 56s. cash and 56s. 1½d. fourteen days; but on Friday the closing prices were, sellers, 55s. 10½d., cash, buyers offering 55s. 9d.

Only a very limited amount of business was done in the coal trade during the past week. The demand is extremely weak for all descriptions, and at present there is no appearance of any improvement except for house coal.

AUTOGEN PURE GAS COMPANY.—At an extraordinary meeting of the shareholders of this company, held on the 29th ult., Mr. C. C. Shirrieff and Mr. T. S. Evans were appointed liquidators.

LUTON WATER COMPANY.—The half-yearly meeting of this company was held on Wednesday last—Mr. F. Brown in the chair. The capital of the company is £21,400. The net profit for the half year was £806 15s. 1d., which, with the amount carried forward from last account, gave an available balance of £884 6s. 1d., and a dividend of 7½ per cent. per annum was declared, leaving £134 6s. 1d. to be carried forward to this half year. It was confidently anticipated that the maximum dividend of 10 per cent. would in a short time be reached, as the water-rentals give an increase of over half per cent. every six months.

ILLEGALLY USING WATER.—On Thursday last, at the Accrington Petty Sessions, Edmund Hargreaves, builder, was summoned by the Accrington Gas and Water Company for unlawfully using their water. The defendant was making bricks, and on the 11th of August, at two o'clock in the morning, the secretary to the company and two police officers went to his house, and found that the water-tap was partially turned on, and the water flowing by a specially constructed drain into the pond where bricks were being made. The bench fined defendant £5 and costs, and awarded the company £1 as compensation.

MANCHESTER DISTRICT ASSOCIATION OF GAS ENGINEERS.—The president of this Association, Mr. John Storer, of Stafford, last Friday entertained about 40 of the members at luncheon, at Alton Towers, the Earl of Shrewsbury having granted that gentleman the privilege of one of the private days usually devoted to his own exclusive use. The party, which also included Mr. J. Shallcross, the Mayor of Stafford; Mr. T. Turner, chairman of the Stafford Gas Company; and Alderman Gibson, inspected the interior of the Towers, and afterwards walked through the delightful gardens and grounds at Alton. A sumptuous luncheon, prepared by Miss Collis, of Alton, was subsequently served in the "Swiss Cottage." Various toasts were given, including those of "The Earl of Shrewsbury," "The Manchester District Association of Gas Engineers," "The President," "The Mayor of Stafford," "Mr. Turner," &c. The party, who were principally gas engineers from the northern part of the kingdom, expressed themselves highly delighted with the day's proceedings, and at an early hour left by train for their various destinations.—*Staffordshire Advertiser.*

CLEVELAND WATER COMPANY.—On Thursday last the half-yearly ordinary meeting of the shareholders in this company was held in the board-room, Saltburn-by-the-Sea. The chair was occupied by Mr. Wharton. On the motion of the chairman, seconded by Mr. Simpson, a dividend at the rate of 10 per cent. per annum for the past six months was declared, payable at once, free of income-tax. The dividend will absorb £2000, leaving £285 15s. 6d. to be carried to next account, and the reserve-fund remains at £2750. The ordinary business having been concluded, the meeting was made special; when, on the motion of the chairman, seconded by Mr. Cockburn, it was resolved that the sum of £40,000 be raised under the powers of, and for the purposes authorized by, the Cleveland Water-Works (1876) Act, in 4000 shares of £10 each, to be offered to the existing shareholders at par. On the motion of Mr. Snaith, seconded by Mr. Cockburn, a vote of thanks was awarded to the officers of the company for the attention paid in securing the successful passage of the company's bill through both Houses of the Legislature during the recent session. A similar vote was passed to the chairman.

PARTICK, HILLHEAD, AND MARYHILL GAS COMPANY.—The ordinary general meeting of this company was held last Tuesday—Provost Cowan presiding. The chairman read the directors report for the year ending June 30 last, from which it appeared that, after paying and providing for all current charges, there had been a profit of £4686 5s. 0½d. Last year's balance brought forward was £240 4s. 7½d., thus making £4926 9s. 8d., which it was proposed to apportion as follows:—A dividend at the rate of 5½ per cent. on the preference shares, less income-tax, £1629 7s. 6d.; a dividend of 3 per cent. on the ordinary shares, free of income-tax, £2533 1s.; balance to be carried forward, £764 1s. 2d.; the dividends to be payable on the 30th of September next. In the course of his remarks he said the dividend was steadily on the increase, and he had no doubt that next year, unless some unforeseen accident occurred, it would be still higher. He moved that the report be adopted. This was agreed to, and subsequently the following resolutions were carried:—"That, in addition to the existing borrowing powers, the directors be authorized to borrow on the debentures of the company such further sums as they may from time to time find expedient, not exceeding in all the sum of £45,000 sterling." "That the directors be empowered to sell, publicly or privately, in whole or in lots, at such prices and at such times as they may think proper, the lands and other property acquired by the company from the Maryhill Gas Company by disposition, dated the 29th and 31st of August and 13th and 17th of September, and recorded on the 10th of October, 1872."

WATER SUPPLY FOR THE TROOPS AT WOOLWICH.—With the view of superseding the ordinary process of the mechanical filtration of water, the War Department have recently erected machinery at Shooter's Hill for softening and purifying the water for the use of the troops at Woolwich. The water used in the process is pumped up by steam from artesian wells from fissures in the chalk formation. Having been filtered through the Kent chalk-beds, the water is stated to be of unusual purity, but of great hardness, which requires to be dealt with before it can be used with advantage, and this is effected, and the hardness of the water reduced, by mixing a concentrated solution of lime with the artesian well-water, in the proportion of 9 ounces of soluble lime to 40 gallons of water. These two previously clear fluids being mixed together, a muddiness immediately supervenes in the water, the abstraction of the carbonic acid rendering the hardening principle (bi-carbonate of lime) insoluble. The lime water, if used perfectly clear, also possesses the property of coagulating dissolved organic matter into white flocculi. The mineral and organic impurities being thus converted into precipitates of greater specific gravity than the water, they settle to the bottom in the course of four or five hours, leaving the superfluent water pure and soft, the same benefit being obtained as would result from the water being boiled two hours, the hardness being reduced from 21° to 6°. At the Government water-works referred to, it has been demonstrated that the chemical purification and softening of water on a large scale far surpasses in simplicity and thoroughness all systems of filtering, a million or ten million gallons being as easily and quickly purified and softened as a single gallon; and the process now in operation at Shooter's Hill is stated to be an entire success.—*The Builder.*

WAKEFIELD GAS COMPANY.—On Monday, the 21st ult., the half-yearly meeting of shareholders was held—Mr. W. Statter presiding. In moving the adoption of the report, he said the company were in a very flourishing state. The consumption of gas during the last half year was 64,915,000 feet, as against 59,263,000 in the corresponding half of the previous year, or an increase of 5,652,000 feet, equal to 8½ per cent. Their unaccounted-for gas was 18 per cent., but nearly 3 per cent. of that arose from over-consumption by the public lamps. The directors had not complained very much to the corporation about this, but had merely reminded them of the fact that whilst they only paid for 3 feet of gas per hour per lamp, they burnt about 4 feet. Deducting that, their net leakage was only 15 per cent. The quantity of gas produced from the coal consumed was most satisfactory, and it was a very good make from coal obtained in their district. They would require, before another year was over, an additional extension of their works, including a new retort-house with an iron roof, besides the new purifiers which were in hand. In order to carry out the works, from £4000 to £5000 would be required in addition to their present capital, and they would be compelled to go to Parliament for further powers. The total expenditure for the half year was £7559 14s. 7d., and the half year's profit was £3802 18s. 7d., which would pay the usual dividend of 10 per cent. on the old shares and 7½ per cent. on the new shares, free of income-tax, and leave £396 to carry to the reserve-fund. The report was adopted, the dividends declared, and the retiring directors and auditor were re-elected. The meeting closed with a vote of thanks to the chairman and the other officers of the company.

ST. PETERSBURG NEW WATER-WORKS COMPANY.—The third ordinary general meeting took place on Thursday, Aug. 31, at the Cannon Street Hotel, London, under the presidency of Mr. A. W. Young, M.P. The directors report, which was taken as read, stated that very little change had taken place in the capital account since February. Only £3000 had been subscribed in debentures out of the sum announced for issue, and this want of support had greatly hampered the directors, and was still a source of anxiety. The company had contracts for, and were supplying nearly 250 houses at St. Petersburg. By the articles of association all the directors retired at the present meeting. Sir Seymour Fitzgerald and Mr. Carbonell did not offer themselves for re-election, and, with a view to economy, the directors proposed that the numbers should be reduced. The chairman, in moving the adoption of the report, said he did not expect, on the present occasion, the company would be able to pay a dividend, but he did expect that they would be a little more advanced than they were. He should have been much more pleased if they could have put a better account before the shareholders. In the history of most companies there was a time when matters were bad, and they were passing through these times. When they started the company, if they had had any reason to believe that they would not be able to borrow money they would have issued more shares, which at the time they were issued were scrambled for. The whole question turned upon whether the inhabitants would take their water. There were the people, there were the houses, and there was the water, but it appeared to be a very slow process to get the people of Russia to take the water. They had made arrangements with their contractor, who had promised to take debentures at five years, which would relieve them to an extent. Mr. Weston seconded the adoption of the report. He stated that he had recently visited St. Petersburg, and from what he saw he thought there were 140,000 persons who would eventually take their water. The retiring directors were re-elected, and Mr. Sangster elected on behalf of the shareholders, and Mr. Anderson on behalf of the company at St. Petersburg. A vote of thanks to the directors and the chairman terminated the proceedings.

KING'S LYNN GAS COMPANY.—The half-yearly meeting of this company was held on Friday, the 25th ult.—Mr. J. D. Thew presiding. The following report was taken as read:—The directors have pleasure in laying before the shareholders a balance-sheet for the year ending June 30, 1876. The net profit on the year's work is £2381 3s. 11d., showing an increase of £491 6s. 4½d. as compared with the preceding year. The directors recommend a dividend of 5 per cent., which will absorb £1600, and they propose to carry the sum of £781 3s. 11d. to the reserve-fund. The chairman, in moving that the report be adopted and the statement of accounts received, referred to the fact that since the last meeting their late chairman, Mr. Thorley, had resigned the post he had

held for some years. He was glad to say, however, that he had not severed his connexion with the company, and they hoped to see him again amongst them. Speaking of their financial position, he (the chairman) thought the shareholders would be satisfied with the balance-sheet that had been laid before them. The directors trusted the company were going on favourably; they had been able to buy coals at a less cost than last year, and the consumption of gas was steadily increasing. They did not think it desirable to recommend the payment of a higher dividend, as they thought it would be better to increase the reserve-fund, and thus be in a position to provide against any emergency. The reserve-fund had now attained the respectable sum of £1700. Mr. Bagge seconded the adoption of the report. He believed it would not be wise to divide a greater dividend than 5 per cent. until the reserve-fund reached the sum of £2000. The motion was passed. Mr. Masters moved that a dividend of 5 per cent. be declared, and that a sum of £781 3s. 11d. be carried to the reserve-fund. This resolution was seconded by Mr. King, and passed. On the motion of Mr. Cruso, seconded by Mr. Newman, a vote of thanks was passed to the chairman and directors, and the chairman having, on behalf of himself and the directors, thanked the meeting for the confidence reposed in them, the proceedings terminated.

LONGTON GAS COMPANY.—The half-yearly meeting was held on Monday, Aug. 28, Mr. W. Webberley in the chair, when the following report was adopted:—"Your directors recommend the payment of the usual dividends—viz., 10 per cent. per annum on the original shares, 7 per cent. per annum on the first and second issue of ordinary 7 per cent. shares, and 5 per cent. per annum on the new ordinary shares. From the profit and loss net revenue account, it will be seen that, with the unappropriated balance from last half year, the amount available to pay dividends is £2606 1s. 1d., and that the dividends will absorb £1648 13s. 6d., leaving a disposable balance of £957 7s. 7d. Your directors have to report that the progress of the company's business continues satisfactory, and that the works and plant of the company have been maintained in a state of efficiency. A deputation from the Town Council of Longton have waited upon your directors for the purpose of asking for an extension of time in which to complete the sale of the works, and at the conclusion of the ordinary meeting a special general meeting of the shareholders will be held, to consider the matter of extension of time, and also of terms." The meeting was then made special for the purpose of considering the propriety of extending the time for the completion of the sale of the works and undertaking of the company, and also to consider the terms on which, if done, such extension of time should be granted. It was decided that the per centage upon the shares, if the gas-works were sold to the corporation, should be raised, the 5 per cent. shares being treated as 7 per cent. stock. It was also decided that a bonus of £2000 more should be allowed; in other words, that, in consequence of the increased value of the gas-works, £2000 more would have to be paid in the purchase. The effect of this decision is, that if the corporation become owners of the gas-works, about £4000 more will have to be paid than was contemplated when the provisional arrangements were made.

WESTON-SUPER-MARE GAS COMPANY.—The half-yearly meeting of this company was held on Tuesday last, when the directors report was presented and approved. It stated, among other things, that the accounts for the last half year were framed in accordance with the forms given in the Gas-Works Clauses Act, 1871, as it appeared, by a recent decision of the law courts, that such Act applied to all companies affected by the Gas-Works Clauses Act, 1847, although the publication of the accounts was only required annually—viz., to Dec. 31 in each year. Owing, no doubt, to the dryness and brightness of the weather, the past quarter's accounts averaged less than usual. The general result, however, was very satisfactory, and the directors were glad to be able to recommend the usual dividends—viz., 10 per cent. per annum on A shares, and 7½ upon B, and also upon payments made in respect of C shares. The comparison of the accounts for the year, from July, 1875, to June, 1876, with those of the previous year, gave the following results:—

		Increase.	Decrease.
Coal used, 1876	3659 tons.	171 tons.	—
Do. 1875	3488 ,,		
Gas-rent account, 1876 . .	£5862 6 1	£368 1 4	—
Do. 1875 . .	5494 4 9		
Residual products, 1876 .	£1164 12 0	—	£176 2 10
Do. 1875 .	1340 14 10		
Town lamps, 1876 . . .	£1092 16 7	£31 2 8	—
Do. 1875 . . .	1061 13 11		
Net cost of coal per ton, deducting residuals, &c., 1876	£0 10 0	—	5d. per ton.
Do. 1875	0 10 5		
Gas sold per ton of coal used, 1876	8190 feet.	190 feet per ton.	—
Do. 1875	8000 ,,		

At a meeting of directors subsequently held, it was resolved to reduce the price of gas, from and after the 30th of September, from 4s. 9d. to 4s. 6d. per 1000 feet, with discounts off as heretofore.

Register of New Patents.

2087.—CLELAND, W., Gas-Works, Linacre, Liverpool, "*Improvements in the means and apparatus for the purification of gas manufactured from coal, cannel, shale, and like materials.*" Provisional protection only obtained. Dated June 7, 1875.

This invention relates to the purification of gas from coal, cannel, shale, and like materials, commonly called coal gas, and consists—

1. In treating lime, oxide of iron, or other material used in the purification of coal gas, so as to bring such material into the condition of porous pellets or nodules easily permeable by the gas, such pellets or nodules having, when filled into the purifier, spaces or passages between them, of sufficient size to allow of easier passage by the gas than when such material is not so treated. To accomplish this the fine particles are separated from the mass by sifting, screening, or like means; such fine particles are then preferably slightly moistened and rescreened, and the operation is repeated until the desired quantity of pellets or nodules is obtained. When lime is the material treated, it is preferred that it should be first slaked and damped in the usual way. Purifiers charged with material thus prepared may be of smaller area and greater depth, or they may contain deeper tiers of the purifying material, or a greater number of tiers may be used in the same vessel, and this in consequence of the reduced resistance offered to the passage of the gas.

2. In employing waste heat from the retort bed or beds to calcine lime to be used in the purification of gas. The limestone or other suitable mineral is placed in suitable kilns, ovens, flues or receptacles, with or without fuel, and the hot gases from the retorts are directed so as to heat the exterior of such kilns or receptacles, or such gases are passed through, over, or in contact with the mineral, so as to raise it to a calcining heat, and bring the lime into the caustic state.

3. In restoring the purifying power of waste lime or lime that has been spent or fouled in the purification of gas, by employing waste heat from the retorts, with or without extraneous fuel, to burn, expel, separate, decompose, or otherwise change the impurities derived from the gas, so as to restore the lime wholly or partly to the caustic condition.

4. In mixing carbonate of lime or other suitable mineral with the waste lime to be treated as described, with or without fuel, in order that the heat of the burning sulphur and other combustible impurities derived from the gas may assist in calcining the lime mineral. [In the second, third, and fourth improvements the draught is assisted, if necessary, by a steam jet or other exhausting or blowing apparatus.]

5. In placing in the vertical pipes of such a condenser or purifier as is described in the specification of an invention of the present patentee, No. 1560, dated May 28, 1870, when used as a primary condenser, what is called a "bottle brush," of wood, iron, or other suitable material, having its radiating bristles, spines, or arms so arranged that the liquors condensing or falling thereon shall drop from one to the other, and so descend the pipes without clogging or choking. This form of condenser performs the part of a purifier, washer, or scrubber to a greater degree than heretofore.

6. In directing on to the "bottle brush" placed in the vertical or nearly vertical columns of any gas condenser, the liquors, or any desired part of the liquors, condensed during the passage of the gas from the retorts to the brush. By this arrangement of parts, the gas and liquor are well broken up, and brought into more intimate contact, so as to increase the scrubbing effect, remove a larger quantity of impurities, and improve the quality of the gas.

2095.—MURDOCH, H. H., Staple Inn, London, "*Improvements in the joints of pipes or tubes.*" A communication. Patent dated June 7, 1875.

This invention consists in forming on the ends of each of the pipes a flange or rib of rectangular section. Upon each of the flanges is placed a ring of india-rubber, and over the rings and flanges is placed a cast-iron confining collar, the edges of which turn inwards so as to take on to the outer side of the flanges. The collars are formed in two semicircular parts, in the ends of which are depressions filled with india-rubber. A single ring or band of india-rubber may, however, be substituted for the two rings. If preferred, the flanges on the pipes may be formed a little in rear of the pipe ends, so as to leave on two pipes placed end to end a short length of the normal diameter of the pipes between the two flanges. Upon this part is placed a ring or band of india-rubber, and the confining collar is formed to correspond.

2105.—SIMMONS, J., New Cross, Kent, "*Improvements in rotary engines and pumps.*" Patent dated June 8, 1875.

This invention relates to the use within a cylinder of a drum-shaped piston mounted eccentrically upon a shaft, and arranged to operate in conjunction with a sliding piece or stop, working within a groove or recess running along the cylinder. A vibrating piece or block is interposed between the sliding piece or stop and the eccentric drum-shaped piston in such manner as that a suitably curved face of the vibrating piece or block shall bear against and follow the varying surface of the piston, and thus form a packing piece to prevent the passage of fluid between the sliding piece or stop and the piston. At each side of the sliding piece or stop an orifice or orifices is or are formed in the cylinder for the admission or emission of fluid. The piston is suitably packed, and may be driven in either direction.

2131.—MAXWELL, N. M., Queen Victoria Street, London, "*Improvements in the construction of taps or cocks.*" Patent dated June 10, 1875.

According to these improvements a passage is formed in the plug, at right angles to, and communicating with, the water-way of the plug. When the tap or cock is closed, the passage may be placed in communication either with the air or with the fluid in the pipe connected with the reservoir containing the same, and thus prevent injury to the tap or cock by reason of the fluid becoming frozen.

2177.—BOLTON, F., Weaste, Lancs., "*An improved index or registering apparatus for gas and water meters.*" Provisional protection only obtained. Dated June 14, 1875.

In this apparatus, instead of the ordinary dials and pointers used on gas and water meters for indicating the number of feet of gas or gallons of water consumed, an index cylinder or drum is made to revolve at any suitable speed, divided into spaces, each representing the money value of a certain amount of gas or water. A pencil being fixed in contact with the cylinder, it follows that, as the drum revolves, a mark is made on the spaces; so that, when it is desired to know the value of the amount of gas or water that has passed through the meter, it is only necessary to refer to the heading at the top of the space or column above the end of the mark, to see in plain figures the exact money value. Provision is also made for turning back the index cylinder or drum, whenever the reading of the meter is taken by the proper authorities, so that the calculation shall commence afresh from the first line or space on the cylinder, and thus a permanent record of each quarter's or year's consumption is obtained.

2183.—JOHNSON, J. H., Lincoln's Inn Fields, London, "*Improvements in wrenches or spanners.*" A communication. Patent dated June 14, 1875.

This invention consists essentially in forming on the arm or body of the wrench or spanner a thread, having a series of breaks or interruptions, and in providing the moveable jaw with a nut tapped with a corresponding intermittent or interrupted screw thread, so arranged as to admit of the nut being turned in one direction, in order to disengage the screw threads, and enable the moveable jaw to be adjusted to the required distance by sliding along the arm or body of the wrench or spanner, or by the arm or body of the wrench or spanner, sliding through the same, and of such nut being then turned in the opposite direction, in order to secure both jaws in their relative adjusted position.

2243.—NORTON, C. D., Stoke Newington, London, "*An improved method of and apparatus for the saving of gas and for economizing the use of gas in railway trains, public buildings, or for other purposes.*" Provisional protection only obtained. Dated June 18, 1875.

According to this invention a metal pipe is conveyed along with the main pipe on the top or sides of the railway carriages with similar flexible pipes between the carriages as are now in use. Junctions are made to correspond with each light at present in use, and into these junctions is inserted the end of another short pipe to lead into the lamp of the carriage, the short pipe being bent in the same or other form as the main pipe; but on the end of the short pipe is a small jet, which is to be always alight during the daytime, the end of which will come in close proximity to the large or principal jet, and protected by means of a metal cover or lantern.

There is also an arrangement by means of taps which are solely under the care and control of the guard belonging to the train, or other person in charge, and by which means, in tunnels or under other circumstances, he can light up the carriages of a whole train, or extinguish the same at pleasure; and when done for the day can turn both taps, and the whole of the gas is then entirely out.

2251.—FAGEOL, P., Paris, "*An improved gas generator.*" Provisional protection only obtained. Dated June 19, 1875.

This invention relates to that description of apparatus for generating combustible gas, wherein atmospheric air is caused to pass through chambers containing volatile oils such as petroleum, so as to become impregnated with the vapour thereof, and consists in an arrangement by which the air is caused by a fan, or other forcing apparatus, to pass in contact with water, in order to separate therefrom any impurities. It is then made to pass successively through a number of compartments containing the volatile oil, with the vapour

of which it becomes impregnated, and afterwards it enters other compartments containing cotton or other fibre, through which the impregnated air is made to pass, in order further to purify it before being led away to be burnt.

2270.—WRIGHT, J. R., Uddingston, N.B., "*An improvement in the construction of regenerative gas furnaces.*" Patent dated June 22, 1875.

This invention consists of an improvement in regenerative gas furnaces, by which the products of combustion are carried down into the regenerators without striking the arch or wall of the regenerator chambers, as is the custom in the present mode of constructing such furnaces.

In order to carry out this improvement the regenerator chambers are placed in such a position that the wall dividing each pair or set of chambers can be continued upward, so as to divide the downtakes to the gas chamber from those to the air chamber, and these downtakes are thus carried direct into the regenerative chambers.

2312.—CLELAND, W., Gas-Works, Linacre, Liverpool, "*Improvements in jet apparatus for giving motion to fluids.*" Patent dated June 24, 1875.

The object of this invention is to provide means whereby, when a jet of elastic fluid used as motive power is caused to act directly on the fluid to be moved, it shall be capable of adjustment so as to act more advantageously when the quantity of either the moved or motor fluid is variable, or the pressure or resistance varies, and consists.—1. In so arranging a series of induction-pipes or mixing nozzles of different sizes that any of them can be readily brought into position to allow of the more efficient action of the motor fluid. The induction pipes or nozzles may be fitted in a disc arranged so as to be revolved, or they may be fitted in a cylinder or on a slide, the object in all cases being to bring the desired one into position. 2. In employing what are called articulated induction-pipes or mixing nozzles, the different lengths or articulations of these being so arranged that they can be readily connected and disconnected to form induction-pipes of several different sizes, in order that those best adapted to the resistance or quantity of the fluid to be moved, or to the quantity or pressure of the motor fluid, can be readily brought into action. 3. In the use of a sliding, telescopic, or otherwise adjustable projector for the jet of motor fluid, so that it may issue from the projector at any desired point in rear of the induction-pipe or at any point in the induction-pipe itself. 4. In employing a sliding, telescopic, or otherwise adjustable induction-pipe, so that it may be lengthened or shortened at pleasure. 5. In employing in combination any two or more of these appliances.

2328.—PEEBLES, D. B., Edinburgh, "*Improvements in governors or apparatus for regulating or controlling the pressure and flow of illuminating or other gas.*" Patent dated June 26, 1875.

This invention comprises various modifications of governors or apparatus for regulating or controlling the pressure and flow of illuminating or other gas, such modifications being respectively designed for station governors, district governors, and lamp or small governors.

A feature of these improved station and district governors consists in the action of their main parts being controlled by small governors, such as those described in the patent granted to the present inventor, and dated Sept. 16, 1871 (No. 2446), or other suitable small kind, such small governor being placed near the large one, or at a greater or less distance from it, as may be most convenient.

In the lamp governor, the principal object of these improvements is to facilitate the cleaning of those parts which are more liable to have their action rendered imperfect by the deposition on them of matters from the gas.

[This invention has recently been described and illustrated in the JOURNAL, in the reports which have appeared of the last meeting of the North British Association of Gas Managers. See page 204 of the present volume.]

2334.—SMYTH, W. W., Maidstone, and HUNT, G. G., New Cross, Kent, "*Improvements in gas-engines.*" Dated June 26, 1875. (Void by reason of the patentees having neglected to file a specification in pursuance of the conditions of the letters patent.)

This invention has for its object improvements in gas-engines, which are constructed with two single-acting cylinders placed, by preference, opposite to each other, and alike in all respects. In each cylinder is a piston, and the two pistons are fixed at the end of a common piston-rod, which by a connecting-rod gives motion to a crank, or in other convenient way the piston-rod is connected with the mechanism it is desired to drive. Each cylinder also contains a loose piston, which together with the main piston operates in the following manner:—When both pistons are near the inner end of the cylinder, a small quantity of gas and air is admitted between them by means of a semi-rotary valve mounted upon the main piston, or by other appropriate valve gear. This charge of gas and air is then fired, and the explosion blows the loose piston to the further or outer end of the cylinder. The cylinder is fitted at its outer end with a cover which operates as a valve yielding to allow the escape of air from the cylinder, so that the loose piston when projected by the explosion sweeps the air in front of it out of the cylinder. When the air has been expelled, the cover closes and prevents the return of air past it. A partial vacuum is left after the explosion between the two pistons, and the atmospheric pressure on the main piston drives it to the other end of the cylinder, producing the effective stroke. At the end of this stroke the two pistons come in contact at the outer end of the cylinder, and in the return stroke the main piston draws the loose piston back with it, a valve in the cylinder cover being open to admit air at this time behind the loose piston. As the pistons approach the inner end of the stroke, gas and air are again admitted between them ready for the next stroke, and this operation occurs alternately in the two cylinders, giving effective double action.

Sometimes one double-acting cylinder is employed in place of two single-acting cylinders. In this case there are two loose pistons, one on either side of the main piston. The action is similar to that of the engine already described. The explosion of a charge of gas and air throws one of the loose pistons to the end of the cylinder. The pressure of the air on the main piston next causes this piston to follow, drawing the other loose piston with it; then as the stroke is being completed another charge of gas and air is admitted behind the main piston, and between it and the second loose piston. This charge is in turn fired, and causes the return stroke of the engine.

2346.—WEST, J., Gas-Works, Maidstone, "*Improvements in apparatus for discharging gas-retorts.*" Patent dated June 28, 1875.

The object of this invention is to afford means whereby the withdrawal of coke from gas-retorts may be facilitated, and the labour of the men reduced, and consists in the construction of a quadrilateral or, by preference, triangular frame, in plan, furnished with wheels which run along a tramway on the retort-house floor in front of the benches. Fixed to the bottom frame is a vertical frame, and attached to a part of this upright frame is a cross-piece or arms capable of sliding up and down, that side of it nearest the retorts being furnished with suitable guides for the purpose. The cross-piece and arms are suspended by a chain passing over a pulley fastened to the top of the frame, and descending to the front, where it passes round a drum or windlass turned by a winch handle fixed to a wheel, upon the axis of which a worm is keyed. This worm gears into a toothed wheel, attached to the drum, and thus imparts motion to it. By this means the cross-piece, and consequently the arms carrying the rakes, may be adjusted so as to suit the varying heights of the retorts. Each of the arms has a sheave or pulley upon which rests the rake-rod. The rake-head is made loose upon the rod, so that although the rod may be turned, the rake-head retains the same position. In front of the rake-head and fixed to the rod is a broad curved plate of iron, called a slipper, the object of which is to permit of the rake being slipped or slid in, over, and unimpeded by, the coke, until it has reached the far end of the retorts when short retorts are employed, and to the middle if through or long retorts are used, when, on the rake handle being partially turned, the slipper is raised against the top of the retort while the rake-head is depressed and prepared to draw out the coke. Power, either manual or otherwise, being then applied to the rake, the coke is withdrawn at one operation, when on the reversal of the rake handle it is ready for insertion in the next retort to be discharged. When necessary, a platform may be attached to the frame, so that the workman may stand thereon, and obtain greater command over the rake.

2381.—BROTHERS, F. W., Cheltenham, and BROTHERS, C., Blackburn, "*Improvements in apparatus used in the manufacture of gas.*" Provisional protection only obtained. Dated June 30, 1875.

This invention has reference to the construction of the retorts and mouthpieces used in the manufacture of gas, and consists in dividing the retort into two or more longitudinal chambers, the upper one or ones being of much smaller capacity than the lower one, and serving only as a conduit for the gas, and to retain it longer in the retort after it is evolved from the coal or other material. The small chamber extends from the back part of the mouthpiece to near the back of the interior of the retort, and is open at both ends. The mouthpiece is furnished with a flap valve attached to a spindle, which passes through and projects on the outside of the mouthpiece. The valve has an opening in it corresponding to the size and shape of the upper and smaller chamber, so that on turning the spindle the valve is brought to butt against the upper chamber, and close the way from the retort to the mouthpiece except through the small chamber or conduit.

The action is as follows:—As soon as the retort is charged with coal or other gas-making material the lid is applied and fastened home. The spindle is then turned, and this causes the valve to rise and close the communication between the distilling chamber and the ascension-pipe except by way of the conduit or small chamber; the consequence is that much of the gas evolved is compelled to travel over a large surface of the hot coke, and thence through the heated upper chamber, the effect being that the light oils which would otherwise escape in the form of vapour, and become condensable at a subsequent stage, are converted into permanent gas. By the use of these improvements the distilling power of the retort is increased, and a larger yield of gas for a given quantity of material is the result.

Advantage may also be taken of this arrangement for inducing a current of air to pass into the retort, and through the conduit to the ascension-pipe (which should be left open for the purpose) whenever it becomes necessary to burn off the carbonaceous deposit, which adheres to the retort. The retorts may be made of either iron or fire-clay, and of any suitable size or shape.

2387.—HOLMES, J. M., Birmingham, "*Improvements in gas stoves for cooking and heating.*" A communication. Patent dated June 30, 1875.

This invention relates to a stove for burning a mixture of illuminating gas and atmospheric air. It consists of two concentric tubes, the space between them constituting an annular chamber in which the gas-supply pipe opens, the gas mixing with the air in the chamber. At the top is a ring of wire gauze or perforated metal forming the burner, which opens into the top of the central tube by a lateral opening, where the gas and air mix with a current of atmospheric air supplied by the inner central tube. Perfect combustion and a white or nearly white flame together with intense heat thereby result.

2412.—BROOKES, W., Chancery Lane, London. "*Improvements in means or apparatus for the manufacture of illuminating gas from petroleum or other hydrocarbon oil.*" A communication. Provisional protection only obtained. Dated July 3, 1875.

This apparatus consists of one or more vertical retorts closed at top and bottom, and having within each of them a spiral blade or screw forming a helical channel for the oil to float down. The retorts are mounted in a suitable furnace. The hydrocarbon oil to be transformed into gas is made to run into the heated retorts, and coming in contact with the heated blades, is transformed into gas, leaving a deposit of carbon upon the blades. When the blades are covered with carbon the ends of the retorts are removed, and a current of air passing through them ignites the carbon, which burns away.

2473.—WHITE, W., Abersychan, near Pontypool, "*Improvements in apparatus used in the manufacture of gas.*" Provisional protection only obtained. Dated July 9, 1875.

This invention has for its object the application of means whereby the retorts, when in action, may be entirely relieved from pressure of the gas due to the dip in the hydraulic main when dip-pipes, as ordinarily constructed or arranged, are employed, and consists in attaching to the upper part of the hydraulic main, at any convenient part, a horizontal pipe or tube, running either the whole length of the retort benches, or divided into sections, each having a communication with a conducting main leading to the condenser or other apparatus. To each dip-pipe is fixed a vertical tube or pipe, leading from the upper part of the dip to the horizontal pipe before mentioned. Each upright pipe is furnished with a cock, having a suitable lever for opening and closing the same.

2499.—PATRICK, R., Branchton, Canada, "*Improvements in rotary pumps and engines.*" Patent dated July 12, 1875.

This invention has relation more particularly to improvements in that class of rotary pumps and engines in which a single cylinder or disc revolves within a cylindrical chamber, and consists of a cylinder or disc of suitable dimensions mounted on a revolving shaft, and provided with a number of sliding blades placed parallel with its axis, which blades, acting in combination with certain peculiarly placed cams projecting from the inner faces of the sides of the disc encasement, produce, as the disc revolves, a perfect or partial vacuum in the chambers or cells between the blades. Into these chambers the gas or fluid to be pumped is forced through suitably-arranged passages, and as the disc revolves the fluid or gas is forced forward by the blades, and discharged through other passages in a continuous stream with great force.

2508.—LAKE, W. R., Southampton Buildings, London, "*An improved liquid-meter.*" A communication. Patent dated July 12, 1875.

This invention relates to a liquid-meter in which the exact amount of water or other liquid passing through it is indicated by the revolutions of a floating disc or wheel against which the fluid is driven in spirally inclined jets, and has for its object the perfect measurement of liquids irrespective of the amount of pressure or head thereon. The principal part consists in the arrangement of a floating disc having a circle of recessed buckets or indentations near its periphery, and resting in a concave seat, through which the water is introduced by means of spirally inclined orifices all enclosed by an overhanging cap or rim, thereby causing the float to revolve without friction or interference from the current produced by the outgoing fluid. It further consists in a novel construction of the coupling between the revolving disc and the stem connecting with the registering mechanism to allow a free movement of the disc, and at the same time correctly indicate its revolutions.

2509.—LAKE, W. R., Southampton Buildings, London, "*Improvements in galvanic apparatus and in contrivances connected therewith, applicable to telegraphic and lighting purposes.*" A communication. Provisional protection not allowed. Application dated July 12, 1875.

This invention relates to galvanic apparatus and contrivances connected therewith to be used, firstly, for pneumatic telegraphic alarms and signals for short distances, such as for hotels or houses; secondly, for lighting chandeliers having a single gas-burner; and thirdly, for lighting chandeliers having several gas-burners.

For lighting a gas chandelier having a single burner the apparatus consists of the following essential parts:—Firstly, a galvanic element; secondly, an air-pump; and thirdly, the igniting apparatus; the whole being arranged and combined in the following manner:—Above the element, which is composed of a cylindrical glass vessel, containing in its lower part the liquid which is specially prepared so as to remain in a serviceable state for several years, an air-pump is arranged, by which the air is compressed and forced down into the element, thereby exciting a current, making red hot a platinum wire which is arranged above a small subsidiary burner. The air-pump is set into action by rods passing down through the plate on which the whole apparatus rests, and provided on their lower part with a handle for pulling. The top of these rods is connected to a tap or cock, the cone of which, being provided with suitable passages for leading the gas to the main and subsidiary burners, is turned simultaneously with depressing the piston of the air-pump, and is arranged in such a manner that on pulling the pump-rod the subsidiary burner is first opened, and the gas issuing from it lighted at the same time by the platinum wire made red hot by the electrical current produced in consequence of the compression of air. On continuing the pulling down of the handle the cone of the tap is turned further round, the main burner is also opened, and the gas issuing from it ignited by the subsidiary burner. This having been effected and the handle let go, the cone of the tap returns far enough to shut off the subsidiary burner, leaving only the main flame burning. If the gas has to be shut off also from this burner, a pawl arranged on the pump-rod is released by means of a drawing rod, in consequence of which a spiral spring forces up the piston of the air-pump, taking along the pump-rods, whereby the tap is entirely shut off, and also the main flame extinguished. The air-pump is fitted with a valve, admitting, in this case, the entrance of air into the pump-barrel.

The part of the invention which relates to apparatus for lighting gas chandeliers with several burners consists of a certain number of galvanic elements, main burners, and subsidiary burners corresponding in number with the branches of the chandelier; further, of an air-pump common to all of the branches or batteries, and a tap or cock, which latter is connected to the rods of the air-pump, and constructed as already described, and is also turned simultaneously with the compression of the air. Both the air-pump and cock, as well as the pump-rods and pulling-handle, are arranged at the centre of the chandelier, and the galvanic elements, which are arranged on the branches below the burners, communicate with the pump-barrel by means of tubes enclosed in the branches of the chandelier, while the main and subsidiary burners communicate by separate pipes, which are also enclosed in the branches of the chandelier, with chambers formed in the centre piece of the chandelier, and separated from each other. These in suitable manner are put into and out of communication with the respective bores of the tap. As in the case of a chandelier with a single burner, on pulling down the rod handle the air-pump is set into action, causing the liquid in the galvanic element to rise, whereby a current is excited which makes the platinum wires above the subsidiary burners red hot, while at the same time the cock is turned for admitting the gas to the subsidiary burners, and after these have been lighted also to the main burners, whereupon the subsidiary burners are shut off.

APPLICATIONS FOR LETTERS PATENT.

3209.—Peyrouse, L. Picot de la, M.D., Finsbury Circus, London, "Improvements in the manufacture of gas." Aug. 15, 1876.

3227.—Baldwin, T., Manchester, and Bailey, W. H., Salford, Lancs, "Improvements in pressure-gauges." Aug. 16, 1876.

3251.—Peebles, D. B., Edinburgh, "Improvements in apparatus for governing, or regulating and adjusting, or otherwise acting on the flow or pressure of illuminating gas; a part of the said improvements being also applicable to two-way or multiple-way valves for other fluids." Aug. 16, 1876.

3319.—Duckett, J. D., Rotherham, York, "An improved cistern and self-acting water-waste preventer (superseding the ball-float)." Aug. 24, 1876.

3365.—Frost, J., Huddersfield, York, "Improvements in purifying sewage and foul water, and in treating water for boiler purposes." Aug. 26, 1876.

3370.—Redfern, G. F., Finsbury, London, "Improvements in gas motor-engines, and in apparatus connected therewith." A communication. Aug. 28, 1876.

3371.—Ber, O., Paris, "An improved automatical apparatus for shutting cocks of gas, steam, water, or other fluids or liquids." Aug. 28, 1876.

3376.—Sieh, P., and Schwarz, T., Hamburg, Germany, "Improvements in gas regulating and saving apparatus." Aug. 28, 1876.

3410.—Chatwin, J., Birmingham, "Certain improvements in the manufacture of gas-burners, as also the parts for receiving and sustaining shades for the same." Aug. 30, 1876.

3422.—M'Manus, H., New York, "Improvements in gas-governors." Partly a communication. Aug. 30, 1876.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

809.—Blundell, G. T. and J. W., Limehouse, London, "Improvements in the arrangement and construction of lavatories." Feb. 26, 1876.

869.—Hallsworth, S., and Bailes, R., Leeds, "Improvements in purifying illuminating coal gas, and in the preparation of the means employed therefor." March 1, 1876.

970.—Sugg, W. T., Westminster, London, "Improvements in gas burners and fittings, or parts thereof, and in the method of manufacturing the same." March 6, 1876.

971.—Sugg, W. T., Westminster, London, "Improvements in public light gas-meters, the receptacles for containing them, and connexions to the same." March 6, 1876.

1034.—Kidd, J., Westminster, London, "Improvements in gas-producing furnaces, and in the methods of utilizing the gases generated therefrom." March 10, 1876.

1057.—Malfroy, A., Rochester, Kent, "A new water-meter, applicable also for measuring other liquids." A communication. March 11, 1876.

1310.—Hocking, J., jun., Redruth, Cornwall, "Improvements in pumps for raising water from mines, and for other such like purposes." March 27, 1876.

1486.—Yeo, E., Newton Abbot, Devon, "Improvements in the treatment of yarns for packing purposes." April 7, 1876.

1823.—Watkinson, R., and Stafford, T., Salford, Lancs, "An improved universal joint for coupling pipes and for stoppering bottles." May 1, 1876.

1831.—Clark, A. M., Chancery Lane, London, "Improved apparatus for charging gas-retorts." A communication. May 1, 1876.

2243.—Butler, G., Southwark, London, "Improvements in valves or cocks." May 27, 1876.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

2349.—Douds, D., and Hartsuff, J. H., "Improvements in steam-pumps." Aug. 7, 1873.

2673.—Wahab, C. J., "Improvements in sieves and filters." Aug. 12, 1873.

2680.—Carey, R., "Improvements in steam engines and pumps." Aug. 12, 1873.

2685.—Harcourt, A. G. V., and Fison, F. W., "Improvements in the purification of gas, and in the extraction of residual products therefrom." Aug. 13, 1873.

2713.—Robinson, A. H., "Improvements in water-meters." Aug. 15, 1873.

2728.—Smyth, J. F., "Improvements in apparatus for the manufacture of gas." Aug. 18, 1873.

2734.—Forster, J. R., "An improved elastic spigot and socket pipe-joint for gas, water, steam, and liquids." Aug. 18, 1873.

Share List of Metropolitan Gas and Water Companies.

(Corrected by Mr. F. N. Golding, Sun Court, Cornhill, from the latest Stock Exchange Quotations.)

Number of Shares issued.	Amount per Share.	Name.	Amount paid up per Share.	Last Divd. p.Cent. p. Ann.	Latest Quotations.
	£	Gas Companies.	£ s. d	£ s. d	£
10000	20	Anglo-Romano . .	20 0 0	10 0 0	16—18
5000	20	Bahia (Limited). .	20 0 0	..	10—11
1000	20	Do., do., redeem.	20 0 0	..	23—25
1500	20	Do., 2nd pref. . .	20 0 0	7 10 0	19—21
40000	5	Bombay (Limited).	5 0 0	7 10 0	6⅞—7¼
10000	5	Do., fourth issue.	4 0 0	7 0 0	1-1⅛ pm.
10000	20	British (Limited) .	20 0 0	10 0 0	38—40
7500	20	Cagliari (Limited).	20 0 0	5 0 0	..
5500000*l.*	Sk.	*Commercial*	100 0 0	10 0 0	205—210
70000	100	Do., 7 per cent. .	..	..	..
20000	20	Continental Union.	20 0 0	6 0 0	23—24
10000	20	Do., new	12 10 0	6 0 0	2-2½ pm.
10000	20	Do., preference .	20 0 0	7 0 0	25—27
5000	10	*Crystal Palace District*	10 0 0	10 0 0	20—20½
5000	10	Do., preference .	10 0 0	6 0 0	13¼—14⅛
10000	7	Do., ordinary . .	10 0 0	7 0 0	14¼—14½
2500	10	Do., converted .	10 0 0	10 0 0	..
2300	10	Do., converted .	10 0 0	7 0 0	..
3797280*l.*	Sk.	*Gaslight & Coke* A.	100 0 0	10 0 0	207-11xd
100000*l.*	,,	Do. B.	100 0 0	4 0 0	80—85
6810*l.*	,,	Do. 5 per ct. pref. conv., 1st issue.	100 0 0	5 0 0	202—204
5910*l.*	,,	Do. do., 2nd do. .	100 0 0	5 0 0	202—204
30000	10	Do. do., 3rd do. .	all	5 0 0	19¼—19⅞
50000	10	Do. do., 4th do. .	4 0 0	5 0 0	6¼—6⅝ pm
50000	10	Do. do., 5th do. .	2 0 0	5 0 0	5⅛—6 pm
2000000*l.*	Sk.	Do. C 10 p.c. pref.	100 0 0	10 0 0	222-7 xd
3000000*l.*	,,	Do. D do. do. .	100 0 0	10 0 0	218-22xd
1650000*l.*	,,	Do. E do. do. .	100 0 0	10 0 0	218-22xd
300000*l.*	,,	Do. F 5 do. do. .	100 0 0	5 0 0	..
600000*l.*	,,	Do. G 7½ do. do. .	100 0 0	7 10 0	160—163
1300000*l.*	,,	Do. H	100 0 0	7 0 0	145—148
23406	10	European (Limited)	10 0 0	10 0 0	18-19 xd
12000	10	Do., new shares.	7 10 0	10 0 0	5½-6p.xd
35406	10	Do., new shares .	5 0 0	10 0 0	4¼-⅜p.xd
6200	5	Georgetown, Guiana	5 0 0	5 0 0	..
5600	10	Hong Kong (Lim.)	10 8 0	10 0 0	15—16
56000	50	*Imprl. Continental*	43 15 0	9 10 0	88—90
3783550*l.*	Sk.	*London*	100 0 0	10 0 0	204—207
1500000*l.*	Sk.	Do., 1st pref. . .	100 0 0	6 0 0	133—138
14450	Sk.	Do., 2nd pref. . .	100 0 0	6 0 0	..
4350	Sk.	Do., 3rd pref. . .	100 0 0	6 0 0	..
7622	25	Do., A shares . .	12 10 0	6 0 0	33—34
26805*l.*	All	Do., Debent. stk.	100 0 0	5*l.* & 6*l.*	8-10 pm.
15000	5	Malta and Mediterranean (Limited).	5 0 0	2 0 0	2—3
6000	5	Do., preference .	5 0 0	7 10 0	4⅜—5¼
20000	5	Mauritius (Limited)	2 0 0	..	1—2
25000	20	Monte Video (Lim.)	20 0 0	8 0 0	16½—17½
8000	10	Nietheroy, Brazil (Limited)	10 0 0	3 10 0	..
30000	5	Oriental (Calcutta).	5 0 0	9 10 0	8—8½
30000	5	Do., new shares .	3 0 0	9 10 0	2-2½ pm.
10000	5	Ottoman (Limited).	5 0 0	3 0 0	..
17500	10	Pará (Limited) . .	10 0 0	7 0 0	4—5
27000	20	*Phœnix*	20 0 0	10 0 0	41—43
3600000*l.*	100	Do., new	55 0 0	7 10 0	99—101
1440000*l.*	Sk.	Do., capitalized .	100 0 0	5 0 0	108—111
36000	20	Rio de Janeiro (L.)	20 0 0	10 0 0	32—34
7359	5	Singapore (Limited)	5 0 0	7 10 0	5¼—5⅝
2000	5	Do., preference .	5 0 0	7 10 0	5⅜—6¼
1500	32½	Shanghai	32 10 0	12 0 0	30—32
4000	50	*South Metropolitan*	50 0 0	10 0 0	104—106
4000	12½	Do.	12 10 0	10 0 0	25½—26½
20000	12½	Do., new shares .	9 0 0	10 0 0	11½—12½ pm.
23406	10	Gas Companies.	£ s. d	£ s. d	£
12000	10	Do., new shares.	7 10 0	10 0 0	5½-6p.xd
35406	10	Do., new shares .	5 0 0	10 0 0	4¼-⅜p.xd
6200	5	Georgetown, Guiana	5 0 0	5 0 0	..
5600	10	Hong Kong (Lim.)	10 8 0	10 0 0	15—16
56000	50	*Imprl. Continental*	43 15 0	9 10 0	88—90
3783550*l.*	Sk.	*London*	100 0 0	10 0 0	204—207
1500000*l.*	Sk.	Do., 1st pref. . .	100 0 0	6 0 0	133—138
14450	Sk.	Do., 2nd pref. . .	100 0 0	6 0 0	..
4350	Sk.	Do., 3rd pref. . .	100 0 0	6 0 0	..
7622	25	Do., A shares . .	12 10 0	6 0 0	33—34
26805*l.*	All	Do., Debent. stk.	100 0 0	5*l.* & 6*l.*	8-10 pm.
15000	5	Malta and Mediterranean (Limited).	5 0 0	2 0 0	2—3
6000	5	Do., preference .	5 0 0	7 10 0	4⅜—5¼
20000	5	Mauritius (Limited)	2 0 0	..	1—2
25000	20	Monte Video (Lim.)	20 0 0	8 0 0	16½—17½
8000	10	Nietheroy, Brazil (Limited)	10 0 0	3 10 0	..
30000	5	Oriental (Calcutta).	5 0 0	9 10 0	8—8½
30000	5	Do., new shares .	3 0 0	9 10 0	2-2½ pm.
10000	5	Ottoman (Limited).	5 0 0	3 0 0	..
17500	10	Pará (Limited) . .	10 0 0	7 0 0	4—5
27000	20	*Phœnix*	20 0 0	10 0 0	41—43
3600000*l.*	100	Do., new	55 0 0	7 10 0	99—101
1440000*l.*	Sk.	Do., capitalized .	100 0 0	5 0 0	108—111
36000	20	Rio de Janeiro (L.)	20 0 0	10 0 0	32—34
7359	5	Singapore (Limited)	5 0 0	7 10 0	5¼—5⅝
2000	5	Do., preference .	5 0 0	7 10 0	5⅜—6¼
1500	32½	Shanghai	32 10 0	12 0 0	30—32
4000	50	*South Metropolitan*	50 0 0	10 0 0	104—106
4000	12½	Do.	12 10 0	10 0 0	25½—26½
20000	12½	Do., new shares .	9 0 0	10 0 0	11½—12½ pm.
15000	10	*Surrey Consumers.*	10 0 0	10 0 0	21—22
10000	10	Do., new	8 0 0	10 0 0	9-10 pm.
9000	4	Unit. Gen. Limrck.	4 0 0	2 10 0	2—2½
1500	10	*Wandsw. & Putney*	10 0 0	10 0 0	19—20
1500	10	Do.	10 0 0	7 10 0	11—12
2957	10	Do.	10 0 0	7 0 0	..
993	10	Do.	3 0 0	7 0 0	..
16000	5	*West Ham*	5 0 0	10 0 0	8—8½
10000	5	Do., new shares .	2 10 0	10 0 0	3—4
		Water Companies.			
12000	100	Chelsea	100 0 0	6 0 0	144—147
1800000	100	East London . . .	100 0 0	6 0 0	146—149
8000	50	Grand Junction . .	50 0 0	7 0 0	75—77
5840	25	Do., ½ shares . .	25 0 0	7 0 0	37½—38½
2160	25	Do., new ditto; max. div., 7½ p.c.	25 0 0	7 0 0	36½—37½
547960	100	Kent	100 0 0	8 0 0	175—180
970	100	Lambeth	100 0 0	6 5 0	143—146
1161	100	Do.	45 0 0	6 5 0	25-30pm
442	100	New River	100 0 0	8 0 0	170—180
4475	100	Do.	30 0 0	8 0 0	50—55
400000	100	Do., deb. sk., 4 p.c.	100 0 0	4 0 0	97—99
3036	100	Southwrk. & Vauxh.	100 0 0	4 0 0	105—108
1296	100	Do., pref. stock .	100 0 0	5 0 0	105—108
..	100	Do., D shares . .	100 0 0	4 0 0	104—107
..	..	Do.	..	4 10 0	..
..	100	Do., new ordinary	..	4 10 0	..
1600	100	Do., new ord. No. 1	40 0 0	4 10 0	103—105
12172	61	West Middlesex . .	61 0 0	6*l.* p.sh.	133—136

D. BRUCE PEEBLES & CO.,
ENGINEERS,
FOUNTAINBRIDGE WORKS, EDINBURGH,
MANUFACTURERS OF WET AND DRY GAS-METERS;
Patentees and Sole Manufacturers of PEEBLES' LAMP-GOVERNORS,
ABOVE 30,000 OF WHICH ARE NOW IN USE.
"These Lamp-Governors are so superior that they are likely to supplant all others."—*Dr. Wm. Wallace, F.R.S.E., F.C.S.*
D. BRUCE PEEBLES AND CO., FOUNTAINBRIDGE WORKS, EDINBURGH.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION has been AWARDED to

GWYNNE & BEALE'S PATENT IMPROVED GAS-EXHAUSTERS,

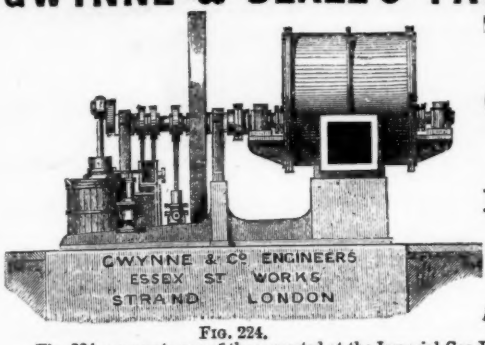


FIG. 224.

The BEST EXHAUSTERS IN THE WORLD.

GWYNNE & CO.

HAVE MADE THE

LARGEST AND MOST PERFECT

EXHAUSTING MACHINERY

Ever produced, and the most economical in working.

Prices and every information on application.

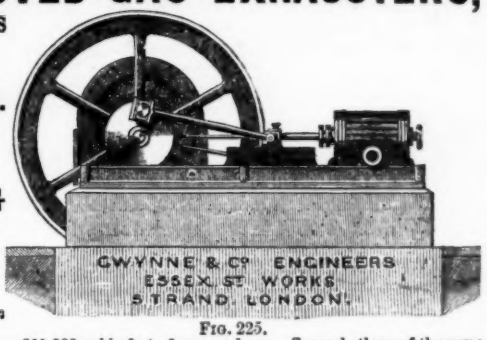


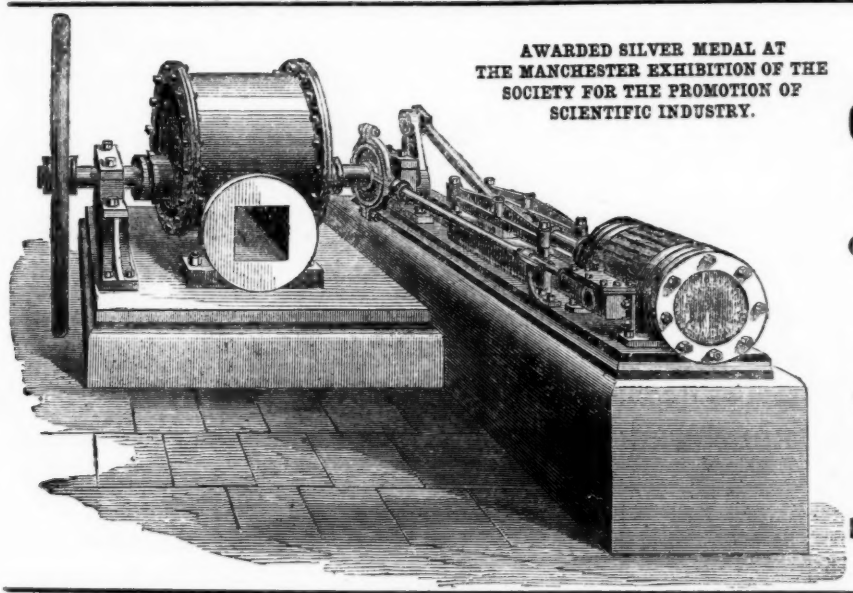
FIG. 225.

Fig. 224 represents one of those erected at the Imperial Gas-Works, Bromley, capable of passing 210,000 cubic feet of gas per hour. Several others of the same size are now on order for the same Company. These Patent Machines combine the highest quality of workmanship and materials, the largest bearings and wearing surfaces, with the **most perfect system of action yet discovered.** Fig. 225 represents one of a series of four at the Nottingham Gas-Works, each passing 52,500 cubic feet per hour. GWYNNE AND Co. *do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, but to produce Machinery of the very highest quality, and the most approved design and arrangement.* Their prices have been estimated with a due regard to the **excellence of the article produced,** and when this is taken into consideration, they have no fear for the result. The orders executed this season for Exhausters and alterations to their patented system amount to over 4,000,000 cubic feet of gas passed per hour, and to over 300 horse power for Engines to drive them. In every instance their work is giving the greatest satisfaction. Numerous testimonials and references can be given.

REGULATORS, BYE-PASSES, STOP-VALVES, GAS-VALVES, & MACHINERY FOR GAS MANUFACTURE, OF ALL SIZES, CAN BE HAD ON APPLICATION TO

GWYNNE & CO., HYDRAULIC & GAS ENGINEERS, ESSEX STREET WORKS, STRAND, LONDON, W.C.

G. & Co. are now manufacturing for a London Gas Company three of their 210,000 cubic feet Patent Gas Exhausters, and many of all sizes.



AWARDED SILVER MEDAL AT THE MANCHESTER EXHIBITION OF THE SOCIETY FOR THE PROMOTION OF SCIENTIFIC INDUSTRY.

BEALE'S

Improved Patent

GAS-EXHAUSTERS

WITH

ENGINES COMBINED.

Sole Makers,

GEORGE WALLER & CO.

Makers of

ENGINES, EXHAUSTERS,
INDEX and DISC GAS-VALVES,
HYDRAULIC MAIN VALVES,
BYE-PASS VALVES,
TAR, LIQUOR, and other PUMPS,
SCRUBBERS and PURIFIERS,
CONDENSERS, BOILERS, &c.

PHŒNIX ENGINEERING WORKS,

HOLLAND STREET, S.E.,

AND

STROUD, GLOUCESTERSHIRE.

WANTED, a copy of the last edition, published in 1872, of Clegg's "Treatise on the Manufacture of Coal Gas," either new or second-hand.
State price to No. 300, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a second-hand Steam-ENGINE, BOILER, and GAS-EXHAUSTER, to pass about 4000 ft. per hour. Must be in good condition.
State terms to J. TAYLER, Secretary, Gas-Works, FAREHAM.

TO FITTERS OR MAIN LAYERS.

WANTED, one of the above, to go into the country. Must be a good and steady workman.
Apply, by letter, stating wages, to J. AND H. ROBUS, Contractors, Bell Green, Catford, LONDON, S.E.

WANTED, by a competent Man, a SITUATION to fix and regulate meters, read indexes, or lay services. Has also a knowledge of interior fitting. Good reference.
Address A. B., 15, Charlotte Street, WEST GREENWICH.

WANTED, a steady Man as Manager for a small Gas-Work, producing about 10 million cubic feet of gas per annum. He must have a thorough knowledge of retort-setting, and all the details of manufacture and distribution.
Apply, by letter, to Mr. THOMAS NEWBIGGING, Consulting Gas Engineer, 5, Norfolk Street, MANCHESTER.

TO STOKERS.

WANTED, two or three good Stokers at the Erith Gas-Works.
Apply to the MANAGER, at the Works, Erith, KENT.

ADVANTAGES OF GAS FOR

COOKING AND HEATING.

HINTS ON GAS BURNERS, &c.

By MAGNUS OHREN, A.I.C.E., F.C.S.

Specimen Copy by post Threepence, direct from MAGNUS OHREN, Gas-Works, Lower Sydenham, London, S.E.

MANAGER.

WANTED, a Manager for the Lichfield Gas-Works, who has a thorough knowledge of everything connected with the make and sale of gas, mains meters, &c.; also to keep the books of the Company. The Manager will have a house, coal, and gas provided. Parties applying should be prepared with security if required. The person appointed will be required to enter upon his duties on the 30th of September next. The annual make of gas is 22 millions, and increasing.
Applications, with testimonials, stating salary required, to be sent in on or before the 9th of September, addressed to Mr. SAMUEL HAYNES, Gas-Works, LICHFIELD.
Aug. 26, 1876.

A DRAUGHTSMAN, aged 20, just concluding an engagement in an eminent Gas Engineer's office in Westminster, desires an APPOINTMENT in a Gas-Work or in a Gas Engineer's Office.
Address No. 299, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

A DRAUGHTSMAN, aged 25, well acquainted with gas plant, seeks EMPLOYMENT under a Gas Engineer. Excellent references. Practical knowledge of general engineering, having passed through shops.
Address No. 302, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

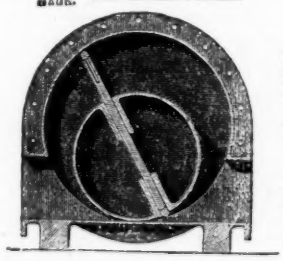
THE Advertiser desires a re-engage-ment as MANAGER of Gas-Works, where the make is about 7 or 8 million cubic feet per annum. Thoroughly understands the management of Gas-Works in all the detail, including all necessary book-keeping.
Apply, stating terms, to A. B. C., care of Postmaster, Nantyfyllon, Maesteg, GLAMORGANSHIRE.

AS FOREMAN OF FITTERS OR MANAGER OF GAS-WORKS.

A Young Man, just disengaged, requires a SITUATION as above. Well up in erection and alteration of works, main and service laying, and internal fitting in all its branches. Can produce first-class testimonials and references. Aged 36.
Address No. 301, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

TRADE MARK.

J. BEALE'S PATENT GAS EXHAUSTER.



BEALE'S CONTINUOUSLY ACTING

GAS EXHAUSTERS

ARE NOW MANUFACTURED BY

B. DONKIN & CO.

MR. J. BEALE, of East Greenwich, having retired from business, has made an arrangement with B. DONKIN & CO. for the sole manufacture of his Patent Solid-Slide Gas Exhausters.
B. D. & Co. also make Steam-Engines to drive Gas Exhausters direct or otherwise, and Gas-Valves.

Estimates and Prices on application to

B. DONKIN & CO.,
ENGINEERS & IRONFOUNDERS,
55a, BLUE ANCHOR ROAD, BERMONDSEY,
LONDON, S.E.

TO GAS MANAGERS.

SITUATION Wanted as Retort-Setter. Experienced in the most improved London and other principles. Fourteen years experience.

Apply to G. E., 6, Argyle Terrace, Peckham Park Road, LONDON.

FOR SALE—A 7000 ft. Gasholder, with guide framing complete. Now working at the Gas-Works, Sutton, Surrey. Price £30.

Apply to the SECRETARY, Gas-Works, Sutton, SURREY.

ON SALE—One square Station-Meter, made by West in 1866, to register 8000 feet per hour, with 8-in. valves, bye-pass, &c., now in use and in good condition.

Apply to J. AND J. BRADDOCK, Globe Meter-Works, OLDHAM.

TO BE SOLD, owing to the laying down of larger ones, four 7 ft. PURIFIERS, with sieves, &c., complete. Can be seen at work till Sept. 29 next. Delivery according to arrangement.

Apply to D. W. LEES, Gas-Works, WILLENHALL.

SECOND-HAND Station-Meter for Sale, to will pass 40,000 cubic feet per hour. In fair condition. Can be seen now erected at the Horseferry Road Station of The Gaslight and Coke Company.

Apply to WILLIAM SUGG, Gas Engineer, Vincent Works, Vincent Street, WESTMINSTER, S.W.

THE Swansea Gaslight Company have for immediate SALE, the following Plant:—

A 6-h.p. Patent Trunk Engine. (Beale.)
Cylindrical Egg-ended Boiler, 20 ft. by 4 ft. 6 in. (Beale.)
Exhauster to pass 15,000 feet per hour. (Beale.)
An 8-h.p. Grasshopper Engine. (Easton and Amos.)
Cylindrical Egg-ended Boiler, 20 ft. by 4 ft. 6 in. (Easton and Amos.)
Exhauster, 20,000 ft. per hour. (Beale.)
Tar, Liquor, and Water Pumps, Eccentrics, Shafting, and Driving Pulleys.
Wrought-iron Condenser, six vertical Legs, 30 ft. high, 24 in. by 6 in., with tar-boxes, dips, and syphons.
Wrought-iron Scrubber, 5 ft. diameter, 20 ft. high.
Cast-iron Scrubber, 3 ft. diameter, 20 ft. high.
A set of four cast-iron Purifiers, 12 ft. square by 5 ft. deep, with galvanized wrought-iron covers, lifting apparatus, four tiers of wooden sieves, 10-in. connexions and valves.

May be seen at the Gas-Works, Swansea. The whole in perfect working order; replaced by plant of larger dimensions.

Further particulars may be obtained on application to Mr. THORNTON ANDREWS, SWANSEA.

PETERBOROUGH CORPORATION WATER-WORKS.

TENDERS FOR CAST-IRON SOCKET-PIPES.

THE Corporation of the Borough of Peterborough are requiring about 6000 tons of SOCKET and other PIPES and CASTINGS.

Persons desirous of tendering for the same are requested to make application, by letter only, to Mr. JOHN ADDY, Civil Engineer, Peterborough (the Engineer for the proposed works), on or before the 9th day of September next.

By order,
W. D. GACHES, Town-Clerk.

Guildhall, Aug., 1876.

TO TAR DISTILLERS, &c.

THE Directors of the Alton Gas Com- pany are prepared to receive TENDERS for their surplus TAR and AMMONIACAL LIQUOR from the date hereof to Sept. 30, 1877. Quantity from 10,000 to 15,000 gallons each. Tenders to be at per gallon in contractor's casks at Railway Station.

Further particulars may be obtained from Mr. Barnley, Manager, at the Works.

Tenders to be sent to Mr. F. BARNLEY, Gas-Works, Alton, HANTS, endorsed "Tender for Tar."

The Company do not pledge themselves to accept the highest or any tender.

TO WELL-SINKERS AND OTHERS.

THE Directors of the Bristol Water- Works Company desire to receive TENDERS for SINKING A WELL in the New Red Sandstone, at their pumping-works, at Chelvey, about nine miles west of Bristol.

Drawings and particulars of which may be seen at the Company's Office, Small Street, BRISTOL; or at the Office of JOHN TAYLOR, Esq., the Company's Consulting Engineer, 27, Great George Street, WESTMINSTER, on and after the 4th of September.

Tenders to be delivered at the Offices, Small Street, Bristol, on Saturday, the 9th of September, before Twelve o'clock noon.

THE TOWN AND COUNTY OF POOLE GAS AND COKE COMPANY, LIMITED.

THE Directors of this Company, under the authority of a Resolution passed at a General Meeting of the Company, held on the 14th inst., have resolved to issue DEBENTURE STOCK for £3500, with interest at 5 per cent. per annum, payable half yearly, in January and July.

The Directors desire to call attention to the fact that, as interest on Debenture Stock takes precedence of all dividends on shares, and the dividend on the share capital of the Company (£9600) was for the last year at the rate of 10 per cent. per annum, the security is unquestionable.

Applications, addressed to the Secretary, will be received at the Company's Office, Poole, for any portion of the said Stock, not less than £50 or any multiple of £50, up to, and including, the 25th of September next.

JOHN BUDDEN, Secretary.

Gas-Works, Poole, Aug. 24, 1876.

THE Vale of Neath Dinas Fire-Brick and Cement Company, Limited, Pontwalby Works, Glyn Neath, South Wales. Manufacturers of the Celebrated Genuine Dinas Fire-Bricks and Cement for Siemens's Regenerative Gas Furnaces, Bessemer Converters, Copper Smelting, Roofs of Puddling Furnaces, Glass-Works, Gas-Works, Coke Ovens, and processes involving intense and long-continued heat. Prices and estimates on application.

London Agency, 11, Queen Victoria Street, City.

JOHN HALL AND CO., STOURBRIDGE,

Manufacturers of FIRE-BRICKS, LUMPS, TILES,

AND EVERY DESCRIPTION OF FIRE-CLAY GOODS.

N.B.—A Stock of 15 and 16 in. CIRCULAR RETORTS always on hand. Other kinds made to order on short Notice.

JAMES MILNE & SON,

GAS ENGINEERS,

Gas-Meter, Gas Apparatus, and Gas-Fittings Manufacturers,

EDINBURGH, AND

2, KING EDWARD STREET,

NEWGATE STREET, LONDON.

Meter Works in London—2, CROSS STREET, WILDERNESS ROW, E.C.

STATION-METERS, GOVERNORS, CONSUMERS METERS, GAS LUSTRES, CHANDELIERS, BRACKETS, &c.,

And every description of Gas-Fittings and Gas Apparatus.

J. T. B. PORTER & CO.,

GAS ENGINEERS & MANUFACTURERS,

IRONFOUNDERS AND CONTRACTORS,

GOWTS BRIDGE WORKS,

LINCOLN.

ESTIMATES FOR GAS-WORKS OF ANY SIZE.

REFERENCES TO 500 WORKS ALREADY ERECTED.

N.B.—It is most particularly requested that all Communications be addressed to the FIRM ONLY, as circumstances have arisen which render this necessary.

MOORE'S PATENT DIP-PIPE.

THE advantages of this Dip will be seen from the engraving. It is thoroughly effectual in its working, removing the whole of the pressure of the hydraulic main from the retort, thus causing a great saving in gas. It is very easy of manipulation, requiring little care and attention; it cannot get out of order, and, when shut, works as an ordinary Dip-Pipe. No accumulation of carbon in retort. Can be fixed to existing H-pipes.

In ordering the Dip, the distance from top side of hydraulic main to water-level should be stated; also the Dip at which it is required to work when the valve is shut.

PRICES—3-in., 35s.; 4-in., 42s.; 5-in., 48s.

SOLE AGENT: J. GILL, GAS-WORKS, BRIDGENORTH,

To whom all communications should be addressed.

MAKERS: THE COALBROOKDALE COMPANY, SHROPSHIRE.

B. GIBBONS, Jun.,

DIBDALE FIRE-CLAY, BRICK, AND GAS-RETORT WORKS,

STOURBRIDGE (Established 1834),

MANUFACTURER OF EVERY DESCRIPTION OF

Burs, Lumps, Stays, Shields & other Bricks, & Gas-Retorts.

A LARGE QUANTITY OF RETORTS ALWAYS IN STOCK.

Circular . 14 in., 15 in., 16 in., 18 in.

Ovals . . 17 in. × 14 in., 17 in. × 15 in., 20 in. × 15 in., 21 in. × 15 in., &c.

D's. . . { 14 in. × 14 in., 15 in. × 12 in., 15 in. × 13 in., 17 in. × 14 in., 18 in. × 13 in.
{ 18 in. × 15 in., 20 in. × 16 in., 22 in. × 14 in., 24 in. × 14 in., 24 in. × 15 in., &c.

Special attention given to the execution of Export Orders.

GEORGE ORME & CO.,

ATLAS METER-WORKS, OLDHAM,

MANUFACTURERS OF

WET AND DRY GAS-METERS,

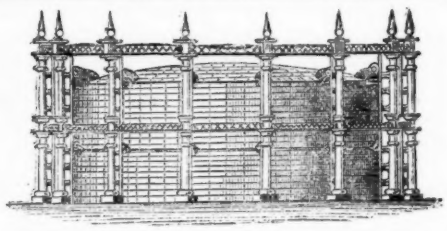
STATION-METERS, GOVERNORS,

PRESSURE AND EXHAUST REGISTERS,

LAMP-METERS IN CAST-IRON BOXES,

And every Description of Gas Apparatus.

HOPE IRON WORKS,



STOCKTON ON TEES.

ASHMORE & WHILE,

GAS ENGINEERS & CONTRACTORS,

MANUFACTURERS OF GASHOLDERS,

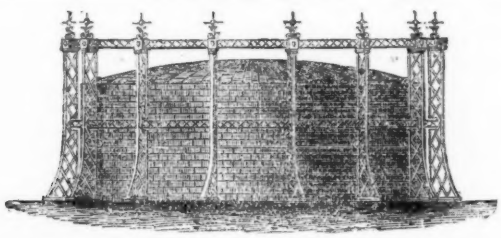
GAS APPARATUS OF EVERY DESCRIPTION,

Including Improved

Retort-Lids, Boilers, Cast and Wrought Iron Tanks, Iron Roofing, Bridges, Girders,

And GENERAL IRONWORK.

N.B.—Estimates for all Gas Plant and Remodelling supplied on application.



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ALSO

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ROBERT M'TEAR has received instructions to SELL the ABOVE, BY AUCTION, at the Glasgow Corporation Gas-Works, Mason Street, Townhead, on Thursday, Sept. 7, at Twelve o'clock.

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To examine the Books and Accounts, and prepare Balance-Sheets for the information of Directors.

To assist Secretaries in preparing Balance-Sheets, according to the "Gas-Works Clauses Act, 1871;" or may be consulted with respect to Accounts generally.

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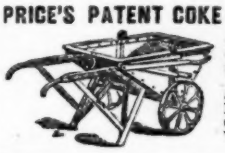

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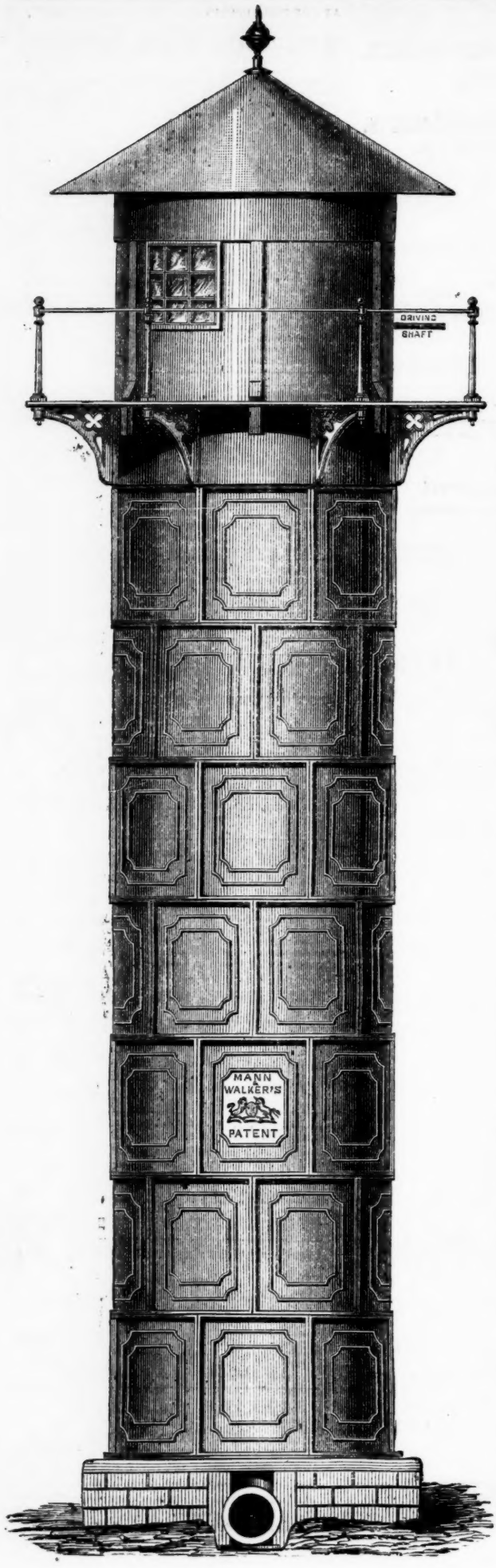

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It is to be particularly noted that the im-portant results of these Scrubbers do not depend upon the machinery alone. The entire internal construction of the Scrubber bears an almost equally important part. For this reason, where it is desirable to convert existing Scrubbers, whose dimensions happen to be suitable, the work commences by ripping out the whole of the interior of the shell, and beginning the internal construction *de novo* from bottom to top.

They are, in all cases, constructed under guarantees to perfectly perform their work. They are now extensively used in the largest gas-works of London and the chief cities of Europe, the number in use exceeds **one hundred,** and their perfect efficiency and profit to a gas company have been fully established with every variety of coal used in Europe. References can be given to the largest gas-works in Europe.

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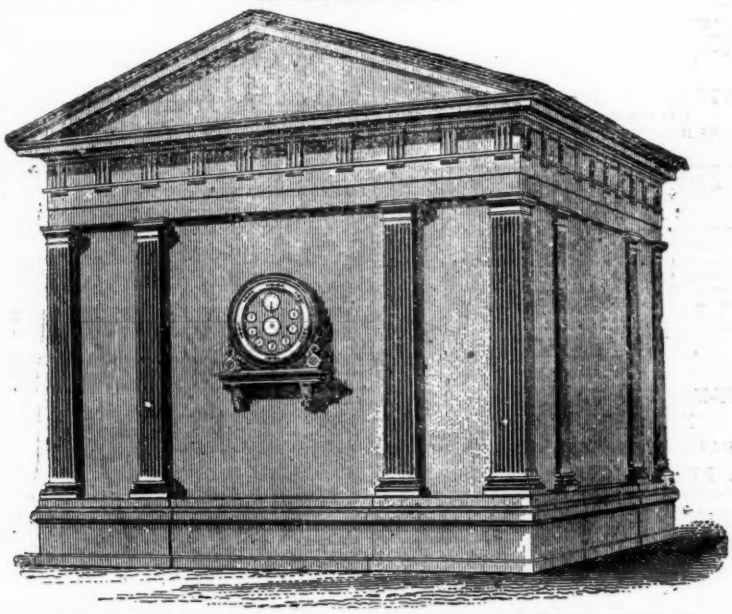

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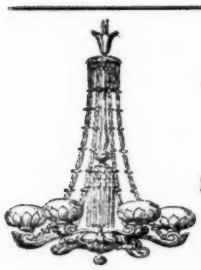

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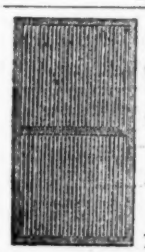

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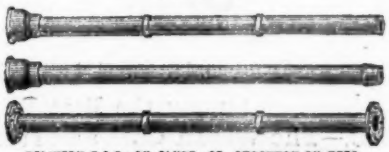

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THE DERBYSHIRE
SILKSTONE COAL COMPANY,
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GAS COAL

Of superior quality, delivered at any station in England and Wales.

Purified gas per ton of coal in cubic feet (average)	10,775
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Analysis by F. J. EVANS, Esq., Chartered Gas Company, Horseferry Road, Westminster:—

(COPY.)

	Cubic Feet of Gas per Ton of Coal.	Illuminating Power in Candles.	Coke per Ton of Coal used.	Ash in Coke, per Cent.	Sulphur in Coal, per Cent.
Silkstone Nuts . . .	10·800	15·85	12·66 cwt.....	6·0	0·69

NOTE.—The illuminating power of the gas was tested by the standard burner now used in London by the Gas Referees, under the City of London Gas Act, 1868.

Horseferry Road, Westminster, March, 1870. (Signed) F. J. EVANS.

These Nuts are extensively used by various Gas Companies throughout the Kingdom, who bear strong testimony to their value.

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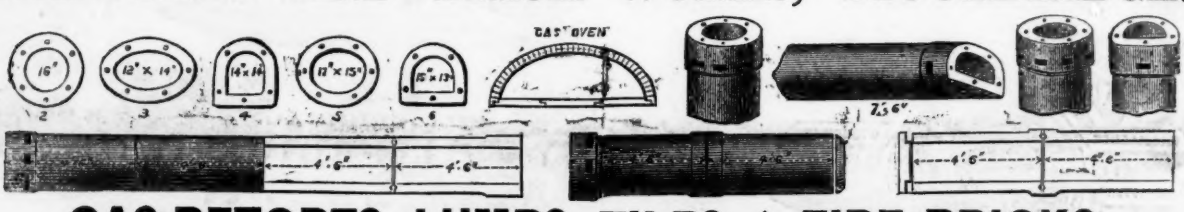

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